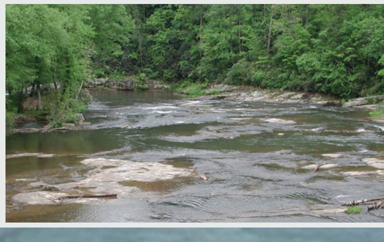
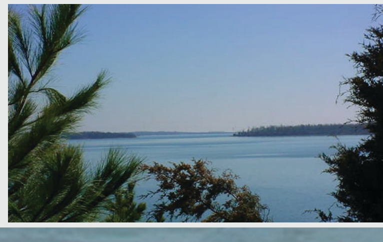
SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL

WATERSHED WATER QUALITY ASSESSMENT

SAVANNAH RIVER BASIN


OCTOBER 2003

PREFACE

In 1993, the South Carolina Department of Health and Environmental Control (SCDHEC) published the first in a series of five watershed management documents. The first in that series, Watershed Water Quality Management Strategy: Savannah-Salkehatchie Basin communicated SCDHEC's innovative watershed approach, summarizing water programs and water quality in the basins. The approach continues to evolve and improve.

The watershed documents facilitate broader participation in the water quality management process. Through these publications, SCDHEC shares water quality information with internal and external partners, providing a common foundation for water quality improvement efforts at the local watershed or large-scale, often interstate, river basin level.

Water quality data from the Savannah River Basin was collected from 1996 to 2000 and assessed at the start of this third five-year watershed management cycle. This updated atlas provides summary information on a watershed basis, as well as geographical presentations of all permitted watershed activities. A waterbody index and a facility index allow the reader to locate information on specific waters and facilities of interest.

A brief summary of the water quality assessments included in the body of this document is provided following the Table of Contents. This summary lists all waters within the Savannah River Basin that fully support recreational and aquatic life uses, followed by those waters not supporting uses. In addition, the summaries list changes in use support status; those that have improved or degraded over the five years since the last assessment was written. More comprehensive information can be found in the individual watershed sections. The information provided is accurate to the best of our knowledge at the time of writing and will be updated in five years.

General information on Savannah River Basin Watershed Protection and Restoration Strategies can be found under that section on page 25, and more detailed information is located within the individual watershed

As SCDHEC continues basinwide and statewide water quality protection and improvement efforts, we are counting on the support and assistance of all stakeholders in the Savannah River Basin to participate in bringing about water quality improvements. We look forward to working with you.

If you have questions or comments regarding this document, or if you are seeking further information on the water quality in the Savannah River Basin, please contact:

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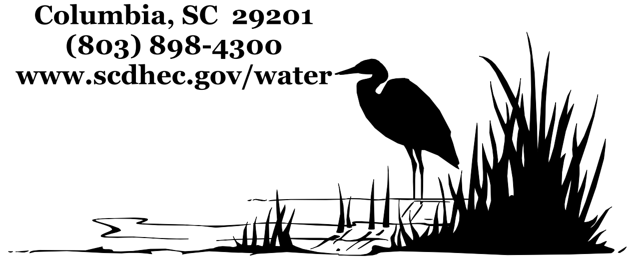

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This document should be cited as:

South Carolina Department of Health and Environmental Control. 2003. Watershed Water Quality Assessment: Savannah River Basin. Technical Report No. 002-03. Bureau of Water, Columbia, S.C.

Water Quality Assessment Summary

Savannah River Basin

TERMS USED IN TABLES

AQUATIC LIFE USE SUPPORT (AL) - The degree to which aquatic life is protected is assessed by comparing important water quality characteristics and the concentrations of potentially toxic pollutants with standards. Aquatic life use support is based on the percentage of standards excursions at a sampling site.

For **dissolved oxygen** and **pH**:

> If the percentage of standard excursions is 10 percent or less, then uses are ***fully supported***.
>
> If the percentage of standard excursions is between 11-25 percent, then uses are ***partially supported***.
>
> If the percentage of standard excursions is greater than 25 percent, uses are ***not supported*** (see p.11 for further information).

For **toxins** (heavy metals, priority pollutants, chlorine, ammonia):

> If the acute aquatic life standard for any individual toxicant is not exceeded, uses are ***fully supported***.
>
> If the acute aquatic life standard is exceeded more than once, but is less than or equal to 10 percent of the samples, uses are ***partially supported***.
>
> If the acute aquatic life standard is exceeded in more than 10 percent of the samples, based on at least ten samples, aquatic life uses are ***not supported*** (see p.11 for further information).

RECREATIONAL USE SUPPORT (REC) - The degree to which the swimmable goal of the Clean Water Act is attained (recreational use support) is based on the frequency of fecal coliform bacteria excursions, defined as greater than 400/100 ml for all surface water classes.

> If 10 percent or less of the samples are greater than 400/100 ml, then recreational uses are said to be ***fully supported***.
>
> If the percentage of standards excursions is between 11-25%, then recreational uses are said to be ***partially supported***.
>
> If the percentage of standards excursions is greater than 25%, then recreational uses are said to be ***nonsupported*** (see p.13 for further information).

Excursion - The term excursion is used to describe a measurement that does not comply with the appropriate water quality standard.

Table 1. Fully Supported Sites in the Savannah River Basin

* = Station not evaluated for Recreational Support

Watershed	Waterbody Name	Station #	Improving Trends	Other Trends
03060102-010	Chattooga River	SV-227	Decreasing BOD5, Turbidity, Total Nitrogen	Increasing Fecal Coliform
		SV-199	Decreasing Turbidity, Fecal Coliform	Increasing Total Phosphorus
	E. Fork Chattooga River	SV-308	Decreasing BOD5	Increasing pH
	E. Fork Chattooga River	SV-792*		
	Lake Tugaloo	SV-359		
03060102-060	Brasstown Creek	SV-673*		
	Tugaloo River arm of Lake Hartwell	SV-200	Decreasing BOD5	Increasing pH
03060102-120	Chauga River	SV-675*		
	Toxaway Creek	SV-225*		
03060101-010	Lake Jocassee	SV-334	Decreasing Fecal Coliform, BOD5, Turbidity, Total Nitrogen	Increasing pH, Total Phosphorus
		SV-335	Decreasing Fecal Coliform, BOD5	Decreasing Dissolved Oxygen; Increasing pH, Total Phosphorus
		SV-336	Decreasing Fecal Coliform, BOD5, Turbidity	Decreasing Dissolved Oxygen; Increasing pH, Total Phosphorus
		SV-337	Decreasing Fecal Coliform, BOD5, Turbidity	Increasing pH
03060101-030	Eastatoe Creek	SV-741*		
		SV-230	Increasing Dissolved Oxygen; Decreasing BOD5, Turbidity, Total Nitrogen, Total Suspended Solids	Increasing pH
	Rocky Bottom Creek	SV-676*		

Table 1. Fully Supported Sites in the Savannah River Basin

* = Station not evaluated for Recreational Support

Watershed	Waterbody Name	Station #	Improving Trends	Other Trends
03060101-030	Lake Keowee	SV-338	Decreasing BOD5, Turbidity, Total Nitrogen, Fecal Coliform	Increasing pH
03060101-040	Wildcat Creek	SV-683*		
	Lake Issaqueena	SV-360		
	Lake Hartwell	SV-249	Decreasing Fecal Coliform, BOD5, Turbidity, Total Nitrogen	Decreasing Dissolved Oxygen
		SV-106	Decreasing Fecal Coliform, BOD5	
		SV-288	Decreasing Fecal Coliform, BOD5, Turbidity, Total Nitrogen	Increasing pH
		SV-339	Decreasing Fecal Coliform, BOD5, Turbidity, Total Nitrogen	Increasing pH, Total Phosphorus
03060101-050	Crane Creek	SV-684*		
	Flat Shoals River	SV-743*		
	Oconee Creek	SV-742*		
	Little River	SV-203	Decreasing Turbidity	
	Lake Keowee	SV-312	Decreasing Fecal Coliform, BOD5, Turbidity, Total Nitrogen	Decreasing Dissolved Oxygen; Increasing pH, Total Phosphorus
		SV-311	Decreasing Fecal Coliform, BOD5, Turbidity, Total Nitrogen	Decreasing Dissolved Oxygen; Increasing Total Phosphorus
03060101-060	Rices Creek	SV-740*		
	Twelvemile Creek	SV-739*		
03060101-070	Twelvemile Creek	SV-107	Decreasing Fecal Coliform, BOD5	Decreasing Dissolved Oxygen

Table 1. Fully Supported Sites in the Savannah River Basin

* = Station not evaluated for Recreational Support

Watershed	Waterbody Name	Station #	Improving Trends	Other Trends
03060101-070	Golden Creek	SV-738*		
03060101-080	Coneross Creek Arm of Lake Hartwell	SV-236	Decreasing BOD_5, Turbidity, Fecal Coliform	Decreasing Dissolved Oxygen
03060101-100	Three and Twenty Creek	SV-735*		
03060103-020	Lake Hartwell	SV-340	Decreasing BOD_5, Turbidity, Fecal Coliform	Increasing pH
03060103-030	Lake Russell	SV-100	Decreasing BOD_5, Turbidity, Total Nitrogen, Fecal Coliform	Decreasing Dissolved Oxygen
		SV-098	Decreasing BOD_5, Turbidity, Total Nitrogen, Fecal Coliform	Increasing Total Phosphorus, pH
	Little Generostee Creek	SV-109*		
03060103-070	Broadway Lake	SV-319		
		SV-258		
		SV-321		
	Hencoop Creek	SV-044*		
	Rocky River	SV-346		
		SV-650*		
		SV-357		
	Lake Secession	SV-332	Decreasing BOD_5, Turbidity	Increasing Total Phosphorus, pH
03060103-080	Wilson Creek	SV-185*		
03060103-100	Lake Thurmond	CL-040		
		SV-291	Decreasing BOD_5, Total Nitrogen	Increasing pH

Table 1. Fully Supported Sites in the Savannah River Basin

* = Station not evaluated for Recreational Support

Watershed	Waterbody Name	Station #	Improving Trends	Other Trends
03060103-100	Lake Thurmond	CL-041		
03060103-140	Little River	CL-039		
	Hogskin Creek	SV-733*		
	Gill Creek	SV-644*		
	Calhoun Creek	SV-171*		
03060103-150	Big Curly Tail Creek	SV-732*		
	Long Cane Creek	SV-318	Increasing Dissolved Oxygen; Decreasing Total Nitrogen, Fecal Coliform	Decreasing pH
03060106-050	Savannah River	SV-251	Decreasing BOD5, Total Nitrogen, Fecal Coliform	Increasing Total Phosphorus; Decreasing pH
		SV-252	Decreasing BOD5, Turbidity, Total Nitrogen, Fecal Coliform	Decreasing pH
		SV-323	Decreasing BOD5, Total Nitrogen, Fecal Coliform	Decreasing pH
03060106-060	Vaucluse Pond	CL-067		
	Flat Rock Pond	SV-686		
	Graniteville Pond #2	SV-722		
	Horse Creek	SV-329	Decreasing BOD5, Total Nitrogen	Increasing Total Phosphorus, Fecal Coliform; Decreasing pH
	Sand River	SV-069	Decreasing Turbidity, Total Nitrogen	
	Langley Pond	CL-069		
	Little Horse Creek	SV-724*		

Table 1. Fully Supported Sites in the Savannah River Basin

* = Station not evaluated for Recreational Support

Watershed	Waterbody Name	Station #	Improving Trends	Other Trends
03060106-100	Upper Three Runs	SV-680*		
		SV-325	Decreasing BOD5, Total Nitrogen	
	Cedar Creek	SV-723*		
03060106-110	Steel Creek	SV-327	Increasing Dissolved Oxygen; Decreasing BOD5, Turbidity, Total Nitrogen	Increasing Total Phosphorus, Fecal Coliform; Decreasing pH
03060106-130	Lower Three Runs	SV-328	Increasing Dissolved Oxygen; Decreasing BOD5, Total Nitrogen	Increasing Turbidity, Fecal Coliform; Decreasing pH
		SV-175	Increasing Dissolved Oxygen; Decreasing BOD5	Increasing Fecal Coliform; Decreasing pH
03060106-140	Savannah River	SV-118	Decreasing Total Nitrogen, Fecal Coliform	Increasing Total Phosphorus; Decreasing pH
	Brier Creek	SV-745*		
03060107-010	Hard Labor Creek	SV-731*		
	Stevens Creek	SV-330	Decreasing BOD_5, Total Phosphorus	Decreasing Dissolved Oxygen
03060107-020	Log Creek	SV-728*		
	Rocky Creek	SV-727*		
	Turkey Creek	SV-729*		
		SV-352		
03060107-030	Beaverdam Creek	SV-068	Decreasing BOD_5	Decreasing pH
		SV-353		
03060107-040	Stevens Creek	SV-063*		
		SV-354		
03060107-040	Horn Creek	SV-726*		

Table 1. Fully Supported Sites in the Savannah River Basin

* = Station not evaluated for Recreational Support

Watershed	Waterbody Name	Station #	Improving Trends	Other Trends
	Cheves Creek	SV-725*		
03060109-050	Savannah River	SV-355		
03060109-060	Cypress Branch	SV-744*		

Table 2. Impaired Sites in the Savannah River Basin

REC=Recreational; AL=Aquatic Life; PS=Partially Supported Standards; NS=Nonsupported Standards; *=Station not evaluated for Recreational Support; T=TMDL Developed

Watershed	Waterbody Name	Station #	Use	Status	Water Quality Indicator	Undesirable Trends	Other Trends
03060102-060	Lake Yonah	SV-358	AL	NS	Total Phosphorus		
03060102-120	Chauga River	SV-344	REC	PS	Fecal Coliform		
03060102-130	Norris Creek	SV-301	REC	NS	Fecal Coliform	Increasing Fecal Coliform	
	Choestoea Creek	SV-108	REC	NS	Fecal Coliform		
	Beaverdam Creek	SV-345	REC	NS^T	Fecal Coliform		
03060101-030	Little Eastatoe Ck	SV-341	REC	PS^T	Fecal Coliform		
03060101-040	Sixmile Creek	SV-205	REC	PS	Fecal Coliform		
	Six and Twenty Creek	SV-181	REC	PS	Fecal Coliform		Increasing Turbidity, Total Phosphorus
03060101-050	Little Cane Creek	SV-343	REC	NS^T	Fecal Coliform		
	Cane Creek	SV-342	REC	NS^T	Fecal Coliform		
03060101-060	North Fork	SV-206	REC	PS	Fecal Coliform	Increasing Fecal Coliform	Increasing Turbidity, pH
03060101-070	Twelvemile Creek	SV-015	REC	NS	Fecal Coliform	Increasing Fecal Coliform	
		SV-137	REC	PS	Fecal Coliform		
	Twelvemile Ck Tributary	SV-136	REC	PS	Fecal Coliform	Increasing Fecal Coliform	Increasing Total Phosphorus
	Golden Creek	SV-239	REC	NS	Fecal Coliform		Increasing Turbidity
03060101-080	Coneross Creek	SV-333	AL	PS	Copper		Increasing Total Phosphorus
			REC	PS^T	Fecal Coliform		

Table 2. Impaired Sites in the Savannah River Basin

REC=Recreational; AL=Aquatic Life; PS=Partially Supported Standards; NS=Nonsupported Standards; *=Station not evaluated for Recreational Support; T=TMDL Developed

Watershed	Waterbody Name	Station #	Use	Status	Water Quality Indicator	Undesirable Trends	Other Trends
03060101-080	Coneross Creek	SV-004	AL	NS	Copper	Increasing Fecal Coliform	Increasing Total Phosphorus, Total Nitrogen
			REC	PS[T]	Fecal Coliform		
03060101-090	Eighteenmile Creek	SV-017	REC	NS	Fecal Coliform		
		SV-245	REC	NS	Fecal Coliform		
		SV-135	REC	NS	Fecal Coliform	Increasing Fecal Coliform	
		SV-268	AL	NS	pH, Total Phosphorus, Chlorophyll-*a*		Increasing BOD5, pH
			REC	PS	Fecal Coliform		
	Woodside Branch	SV-245	REC	PS	Fecal Coliform		Decreasing pH
03060101-100	Three and Twenty Creek	SV-111	REC	NS	Fecal Coliform	Increasing Fecal Coliform	
03060103-030	Big Generostee Creek	SV-316	REC	NS	Fecal Coliform	Increasing Fecal Coliform	
		SV-101*	AL	PS	Macroinvertebrates		
03060103-070	Cupboard Creek	SV-139	AL	NS	Dissolved Oxygen		Decreasing pH; Increasing Turbidity
			REC	NS	Fecal Coliform		
		SV-140	REC	NS	Fecal Coliform	Increasing Fecal Coliform	Decreasing pH; Increasing Turbidity
	Broadway Creek	SV-141	AL	PS	Macroinvertebrates		
			REC	NS	Fecal Coliform		

Table 2. Impaired Sites in the Savannah River Basin

REC=Recreational; AL=Aquatic Life; PS=Partially Supported Standards; NS=Nonsupported Standards; *=Station not evaluated for Recreational Support; T=TMDL Developed

Watershed	Waterbody Name	Station #	Use	Status	Water Quality Indicator	Undesirable Trends	Other Trends
03060103-070	Betsy Creek	SV-037	AL	NS	Copper		Decreasing Dissolved Oxygen; Increasing Fecal Coliform
	Cherokee Creek	SV-043	REC	NS	Fecal Coliform	Increasing Fecal Coliform	Increasing pH
	Rocky River	SV-031	REC	NS	Fecal Coliform	Increasing Fecal Coliform	Decreasing pH; Increasing Turbidity
		SV-041	REC	PS	Fecal Coliform	Increasing Fecal Coliform	Increasing Total Nitrogen
	Lake Secession	SV-331	AL	NS	Total Phosphorus, pH	Increasing pH	
03060103-080	Wilson Creek	SV-347	REC	PS	Fecal Coliform		
03060103-140	Little River	SV-164	REC	PS	Fecal Coliform		
		SV-348	REC	NS	Fecal Coliform		
		SV-192	REC	PS	Fecal Coliform		
	Sawney Creek	SV-052	AL	PS	Dissolved Oxygen	Decreasing Dissolved Oxygen	Increasing Total Nitrogen; Decreasing pH
			REC	NS	Fecal Coliform	Increasing Fecal Coliform	
03060103-150	Johns Creek	SV-734*	AL	PS	Macroinvertebrates		
	Blue Hill Creek	SV-053B	AL	NS	Turbidity	Increasing Fecal Coliform	Decreasing pH
			REC	NS	Fecal Coliform		
	Double Branch	SV-054*	AL	PS	Macroinvertebrates		
	Long Cane Creek	SV-349	REC	NS	Fecal Coliform		

Table 2. Impaired Sites in the Savannah River Basin

REC=Recreational; AL=Aquatic Life; PS=Partially Supported Standards; NS=Nonsupported Standards; *=Station not evaluated for Recreational Support; T=TMDL Developed

Watershed	Waterbody Name	Station #	Use	Status	Water Quality Indicator	Undesirable Trends	Other Trends
03060106-030	Stevens Creek Reservoir	SV-294	AL	PS	Dissolved Oxygen, pH		Increasing Fecal Coliform
03060106-060	Horse Creek	SV-071	AL	NS	pH	Decreasing pH	
		SV-096	AL	PS	pH	Decreasing pH	
		SV-072	REC	PS	Fecal Coliform		Decreasing pH
		SV-250	AL	NS	pH	Decreasing pH; Increasing Fecal Coliform	
			REC	PS	Fecal Coliform		
03060106-070	Hollow Creek	SV-350	REC	PS	Fecal Coliform		
03060106-100	Tims Branch	SV-324	REC	PS	Fecal Coliform		Decreasing pH
03060106-110	Fourmile Creek	SV-326	REC	PS	Fecal Coliform		Increasing Total Phosphorus; Decreasing pH
03060107-010	Hard Labor Creek	SV-151	AL	PS	Macroinvertebrates		Decreasing pH
			REC	NS	Fecal Coliform		
	Cuffytown Creek	SV-351	REC	PS	Fecal Coliform		
	Rocky Creek	SV-730*	AL	PS	Macroinvertebrates		
03060109-060	Cypress Creek	SV-356	AL	NS	Dissolved Oxygen		
	Savannah River	SV-191	REC	PS	Fecal Coliform		Increasing pH

Table 3. Changes in Use Support Status

Savannah River Basin Sites that Improved from 1996 to 2000

REC= Recreational; AL=Aquatic Life; FS=Fully Supported Standards; PS=Partially Supported Standards; NS=Nonsupported Standards

Watershed	Waterbody Name	Station #	Use	Status		Water Quality Indicator	
				1996	2000	1996	2000
03060102-130	Beaverdam Creek	SV-739	AL	PS	FS	Macroinvertebrate	
03060101-010	Lake Jocassee	SV-335	AL	NS	FS	Copper, Zinc	
		SV-336	AL	NS	FS	Copper	
03060101-030	Eastatoe Creek	SV-230	AL	NS	FS	Zinc	
	Lake Keowee	SV-338	AL	NS	FS	Copper	
03060101-040	Lake Hartwell	SV-288	AL	NS	FS	Copper	
		SV-339	AL	NS	FS	Copper	
03060101-050	Lake Keowee	SV-311	AL	PS	FS	Zinc	
03060101-070	Golden Creek	SV-738	AL	PS	FS	Macroinvertebrate	
	Twelvemile Creek	SV-137	REC	NS	PS	Fecal Coliform	
03060101-090	Eighteenmile Creek	SV-268	REC	NS	PS	Fecal Coliform	Fecal Coliform
	Woodside Branch	SV-241	REC	NS	PS	Fecal Coliform	Fecal Coliform
03060101-100	Three and Twenty Creek	SV-735	AL	PS	FS	Macroinvertebrate	
03060103-020	Lake Hartwell	SV-340	AL	NS	FS	Copper	
03060103-070	Rocky River	SV-650	AL	PS	FS	Macroinvertebrate	
		SV-041	REC	NS	PS	Fecal Coliform	Fecal Coliform
		SV-650	AL	PS	FS	Macroinvertebrate	
	Cupboard Creek	SV-140	AL	NS	FS	Dissolved Oxygen	
	Lake Secession	SV-331	REC	PS	FS	Fecal Coliform	
03060103-080	Wilson Creek	SV-185	AL	PS	FS	Macroinvertebrate	
03060103-150	Long Cane Creek	SV-318	REC	PS	FS	Fecal Coliform	
03060106-050	Savannah River	SV-252	REC	PS	FS	Fecal Coliform	
03060106-060	Horse Creek	SV-329	AL	PS	FS	Copper	
		SV-096	AL	NS	PS	Copper	pH
			REC	PS	FS	Fecal Coliform	
	Sand River	SV-069	REC	PS	FS	Fecal Coliform	

Savannah River Basin Sites that Improved from 1996 to 2000

REC= Recreational; AL=Aquatic Life; FS=Fully Supported Standards; PS=Partially Supported Standards; NS=Nonsupported Standards

Watershed	**Waterbody Name**	**Station #**	**Use**	**Status**		**Water Quality Indicator**	
				1996	**2000**	**1996**	**2000**
03060106-100	Upper Three Runs	SV-325	REC	PS	FS	Fecal Coliform	
03060106-130	Lower Three Runs	SV-328	AL	PS	FS	Copper	
03060106-140	Savannah River	SV-118	AL	NS	FS	Zinc	
03060107-010	Stevens Creek	SV-330	REC	PS	FS	Fecal Coliform	
	Hard Labor Creek	SV-151	AL	NS	PS	Copper, Macroinvertebrate	Macroinvertebrate
03060107-030	Beaverdam Creek	SV-353	REC	PS	FS	Fecal Coliform	

Table 4. Changes in Use Support Status

Savannah River Basin Sites that Degraded from 1995 to 1999

REC= Recreational; AL=Aquatic Life; FS=Fully Supported Standards; PS=Partially Supported Standards; NS=Nonsupported Standards

Watershed	Waterbody Name	Station #	Use	Status		Water Quality Indicator	
				1995	1999	1995	1999
03060101-090	Eighteenmile Creek	SV-268	AL	FS	NS		pH, Total Phosphorus, Chlorophyll-*a*
03060102-060	Lake Yonah	SV-358	AL	FS	NS		Total Phosphorus
03060102-120	Chauga River	SV-344	REC	FS	PS		Fecal Coliform
03060103-070	Cherokee Creek	SV-043	REC	PS	NS	Fecal Coliform	Fecal Coliform
	Lake Secession	SV-331	AL	FS	NS		Total Phosphorus, pH
03060103-140	Little River	SV-348	REC	PS	NS	Fecal Coliform	Fecal Coliform
		SV-192	REC	FS	PS		Fecal Coliform
	Sawney Creek	SV-052	AL	FS	PS		Dissolved Oxygen
03060103-150	Blue Hill Creek	SV-053B	AL	FS	NS		Turbidity
03060106-030	Stevens Ck Res.	SV-294	AL	FS	PS		Dissolved Oxygen, pH
03060106-060	Horse Creek	SV-071	AL	FS	NS		pH
		SV-250	AL	FS	NS		pH
			REC	FS	PS		Fecal Coliform
	Little Horse Creek	SV-073	AL	FS	PS		pH
03060106-070	Hollow Creek	SV-350	REC	FS	PS		Fecal Coliform
03060106-110	Fourmile Creek	SV-326	REC	FS	PS		Fecal Coliform

Introduction

The South Carolina Department of Health and Environmental Control (SCDHEC or the Department) initiated its first watershed planning activities as a result of a U.S. Environmental Protection Agency (USEPA) grant in June of 1972. These activities were soon extended by requirements for a Continuing Planning Process under §303(e), "Federal Water Pollution Control Act Amendments of 1972", U.S. Public Law 92-500. In 1975, the SCDHEC published basin-planning reports for the four major basins in South Carolina. A related planning activity resulted from §208 of the Federal Water Pollution Control Act, which required states to prepare planning documents on an areawide basis. Areawide plans were completed in the late 1970's for the five designated areas of the State and for the nondesignated remainder of the State. To date, these plans or their updated versions have served as information sources and guides for water quality management. The Continuing Planning Process, watershed assessments, and 208 plans are elements of South Carolina's overall water quality management plan.

The Bureau of Water emphasizes watershed planning to better coordinate river basin planning and water quality management. Watershed-based management allows the Department to address Congressional and Legislative mandates in a coordinated manner and to better utilize current resources. The watershed approach also improves communication between the Department, the regulated community, and the public on existing and future water quality issues.

Purpose of the Watershed Water Quality Assessment

A watershed is a geographic area into which the surrounding waters, sediments, and dissolved materials drain, and whose boundaries extend along surrounding topographic ridges. Watershed-based water quality management recognizes the interdependence of water quality related activities associated with a drainage basin including: monitoring, problem identification and prioritization, water quality modeling, planning, permitting, and other activities. The Bureau of Water's watershed approach integrates these and other activities by watershed, resulting in appropriately focused water quality protection efforts. While an important aspect of the program is water quality problem identification and solution, the emphasis is on problem prevention.

The Department has divided the State into five regions (areas consisting of one or more river basins), along hydrologic lines, which contain approximately the same number of NPDES permitted dischargers. A Watershed Water Quality Assessment (WWQA) will be created for each major river basin within the five regions and will be updated on a five-year rotational basis. This will allow for effective allocation and coordination of water quality activities and efficient use of available resources. The Savannah River Basin is subdivided into 35 watersheds or 11-digit hydrologic units within the State of South Carolina. Within the Department's Savannah River Basin are the Chattooga River, the Tugaloo River, the Chauga River, the Keowee River, the Seneca River, the Little River, the Savannah River, the Rocky River, and another Little River . The hydrologic units used are from the 1999 USGS Hydrologic Unit Code for South Carolina, made in cooperation with the USDA Natural Resources Conservation Service and SCDHEC. In an effort to make these units more representative of actual hydrology, SCDHEC has proposed changes to the 1999 map affecting numerous boundaries in the Savannah River

Basin. These changes have been provisionally approved by USGS pending a future statewide update. Appendix A. lists all SCDHEC geographic features (ie. stations, facilities) and any watershed boundary changes that may have occurred as a result of these provisional changes. All water quality related evaluations are made at the 11-digit watershed level. The stream names used are derived from USGS topographic maps. The National Hydrography Dataset (NHD) was the system used in the development of the digital hydrography and stream length estimates. NHD is based on the content of the USGS 1:100,000 scale Digital Line Graph (DLG) hydrography data, integrated with reach (stream) related information from the USEPA Reach File Version 3.0 (RF3) data. Based on the blue line streams of the USGS topo maps, it is likely that portions of the stream network in terms of perennial, intermittent, and ephemeral streams are not represented.

The watershed-based assessments fulfill a number of USEPA reporting requirements including various activities under §303(d), §305(b), §314, and §319 of the Clean Water Act (CWA). Section 303(d) requires a listing of waters located within a watershed that do not meet applicable water quality standards. Section 305(b) requires that the State biennially submit a report that includes a water quality description and analysis of all navigable waters to estimate environmental impacts. Section 314 requires that the State submit a biennial report that identifies, classifies, describes, and assesses the status and trends in water quality of publicly owned lakes. The watershed plan is also a logical evaluation, prioritization, and implementation tool for nonpoint source (§319) requirements. Nonpoint source best management practices (BMPs) can be selected by identifying water quality impairments and necessary controls, while considering all the activities occurring in the drainage basin.

The assessment also allows for more efficient issuance of National Pollutant Discharge Elimination System (NPDES) and State wastewater discharge permits. Proposed permit issuances within a watershed may be consolidated and presented to the public in groups, rather than one at a time, allowing the Department to realize a resource savings, and the public to realize an information advantage.

The Watershed Water Quality Assessment (WWQA) is a geographically-based document that describes, at the watershed level, all water quality related activities that may potentially have an adverse impact on water quality. The Watershed Implementation Staff investigates the impaired streams mentioned in the WWQA to determine, where possible, the source of the impairment and recommends solutions to correct the problems. As part of this effort, the watershed staff is forging partnerships with various federal and state agencies, local governments, and community groups. In particular, the Department's Watershed Program and the Natural Resource Conservation Service (NRCS) district offices are working together to address some of the nonpoint source (NPS) concerns in the basin. By combining NRCS's local knowledge of land use and the Department's knowledge of water quality, we are able to build upon NRCS's close relationships with landowners and determine where NPS projects are needed. These projects may include educational campaigns or special water quality studies.

Factors Assessed in Watershed Evaluations

Surface Water Quality

SCDHEC's Bureau of Water and Bureau of Environmental Services ensure that the water in South Carolina is safe for drinking and recreation, and that it is suitable to support and maintain aquatic flora and fauna. Functions include planning, permitting, compliance assurance, enforcement, and monitoring. This section provides an overview of water quality evaluation and protection activities.

Monitoring

In an effort to evaluate the State's water quality, the Department operates and collects data from a permanent statewide network of primary and secondary ambient monitoring stations and flexible, rotating watershed monitoring stations. The ambient monitoring network is directed toward determining long-term water quality trends, assessing attainment of water quality standards, identifying locations in need of additional attention, and providing background data for planning and evaluating stream classifications and standards.

Ambient monitoring data are also used in the process of formulating permit limits for wastewater discharges with the goal of maintaining State and Federal water quality standards and criteria in the receiving streams in accordance with the goals of the Clean Water Act. These standards and criteria define the instream chemical concentrations that provide for protection and reproduction of aquatic flora and fauna, help determine support of the classified uses of each waterbody, and serve as instream limits for the regulation of wastewater discharges or other activities. In addition, these data are used in the preparation of the biennial §305(b) report to Congress, which summarizes the State's water quality with respect to attainment of classified uses by comparing the ambient monitoring network data to the State Water Quality Standards.

SCDHEC's ambient water quality monitoring network comprises four main station types: primary (P), secondary (S), watershed (W), and biological (BIO) stations. These station types are listed in the site descriptions preceding the water quality information in each watershed and in Appendices B-D under Ambient Water Quality Monitoring Site Descriptions. Not all parameters are collected at every site. Primary stations are sampled on a monthly basis year round. The static primary station network is operated statewide, and receives the most extensive parameter coverage, thus making it best suited for detecting long-term trends.

Secondary stations are sampled monthly from May through October, a period critical to aquatic life, and characterized by higher water temperatures and lower flows. Secondary stations are located in areas where specific monitoring is warranted due to point source discharges, or in areas with a history of water quality problems. Secondary station parameter coverage is less extensive and more flexible than primary or watershed station coverages. The number and locations of secondary stations have greater annual variability than do those in the primary station network, and during a basin's target year may have parameter coverage and sampling frequency duplicating that of primary or watershed stations.

Watershed stations are sampled on a monthly basis, year round, during a basin's target year. Additional watershed stations may be sampled monthly from May through October to augment the secondary station network. Watershed stations are located to provide more complete and representative coverage within the larger drainage basin, and to identify additional monitoring needs. Watershed stations have the same parameter coverage as primary stations.

Ambient biological trend monitoring is conducted to collect data to indicate general biological conditions of State waters that may be subject to a variety of point and nonpoint source impacts. Ambient biological sampling is also used to establish regional reference or "least impacted" sites from which to make comparisons in future monitoring. Additionally, special macroinvertebrate studies, in which stream specific comparisons among stations located upstream and downstream from a known discharge or nonpoint source area, are used to assess impact.

Qualitative sampling of macroinvertebrate communities is the primary bioassessment technique used in ambient biological trend monitoring. A habitat assessment of general stream habitat availability and a substrate characterization is conducted at each site. Annual ambient biological monitoring is conducted during low flow "worst case" conditions in July - September. Some coastal plain streams that have no flow conditions in the summer months may be sampled in the winter (January-March). This technique may also be used in special studies for the purpose of determining if, and to what extent, a wastewater discharge or nonpoint source runoff is impacting the receiving stream. A minimum of two sample locations, one upstream and one downstream from a discharge or runoff area, is collected. At least one downstream recovery station is also established when appropriate. Sampling methodology follows procedures described in Standard Operating Procedures, Biological Monitoring. Only sites described as ‘BIO’ will collect information on the macroinvertebrate communities used in the ambient biological trend monitoring.

Many pollutants may be components of point source discharges, but may be discharged in a discontinuous manner, or at such low concentrations that water column sampling for them is impractical. Some pollutants are also common in nonpoint source runoff, reaching waterways only after a heavy rainfall; therefore, in these situations, the best media for the detection of these chemicals are sediment and fish tissue where they may accumulate over time. Their impact may also affect the macroinvertebrate community.

Aquatic sediments represent a historical record of chronic conditions existing in the water column, and sediment samples are analyzed at selected monitoring sites. Pollutants bind to particulate organic matter in the water column and settle to the bottom where they become part of the sediment "record". Accumulated sediments not only reflect the impact of point source discharges, but also incorporate nonpoint source pollution washed into the stream during rain events. As a result, contaminant concentrations originating from irregular and highly variable sources are recorded in the sediment. The sediment concentrations at a particular location do not vary as rapidly with time as do the water column concentrations. Thus, the sediment record may be read at a later time, unrelated to the actual release time. Lakes act as settling basins for materials entering the lake system directly from a discharge or indirectly from the land surface washed into streams. Therefore, it is not unusual for lake sediment concentrations to be higher than sediment concentrations found in streams.

The ambient monitoring program has the capability of sampling a wide range of media and analyzing them for the presence or effects of contaminants. Ambient monitoring data from 46 primary (P) stations, 25 secondary (S) stations, 36 watershed (W) stations, 62 biological (BIO) stations, and 1 sediment station (SED) were reviewed for the Savannah River Basin.

Natural Swimming Areas

Although all waters of the State are protected for swimming, some areas are more popular than others and may require closer monitoring. Currently monitored areas are located and discussed in the appropriate watershed evaluations.

Classified Waters, Standards, and Natural Conditions

The waters of the State have been classified in regulation based on the desired uses of each waterbody. State standards for various parameters have been established to protect all uses within each classification. The water-use classifications that apply to this basin are as follows.

Class ORW, or "outstanding resource waters", are freshwaters or saltwaters that constitute an outstanding recreational or ecological resource, or those freshwaters suitable as a source for drinking water supply purposes, with treatment levels specified by the Department.

Class A were freshwaters that were suitable for primary contact recreation. This class was also suitable for uses listed as Class B. As of April 1992, Class A and Class B waters were reclassified as Class FW, which protects for primary contact recreation.

Class B were freshwaters that were suitable for secondary contact recreation and as a source for drinking water supply, after conventional treatment, in accordance with the requirements of the Department. These waters were suitable for fishing, and the survival and propagation of a balanced indigenous aquatic community of fauna and flora. This class was also suitable for industrial and agricultural uses. The main difference between the Class A and B freshwater was the fecal coliform standard. Class A waters were not to exceed a geometric mean of 200/100ml, based on 5 consecutive samples during any 30 day period; nor were more than 10% of the total samples during any 30 day period to exceed 400/100ml. Class B waters were not to exceed a geometric mean of 1000/100ml, based on 5 consecutive samples during any 30 day period; nor were more than 20% of the total samples during any 30 day period to exceed 2000/100ml. As of April 1992, Class A and Class B waters were reclassified as Class FW, which protects for primary contact recreation.

Class FW, or "freshwaters", are freshwaters that are suitable for primary and secondary contact recreation and as a source for drinking water supply, after conventional treatment, in accordance with the requirements of the Department. These waters are suitable for fishing, and the survival and propagation of a balanced indigenous aquatic community of fauna and flora. This class is also suitable for industrial and agricultural uses.

Class SA comprises "tidal saltwaters" suitable for primary and secondary contact recreation, crabbing and fishing. These waters are not protected for harvesting of clams, mussels, or oysters for market purposes or human consumption. The waters are suitable for the survival and propagation of a balanced indigenous aquatic community of marine fauna and flora.

Class SB are "tidal saltwaters" suitable for the same uses listed in SA. The difference between the Class SA and SB saltwater concerns the DO limitations. Class SA waters must maintain daily DO averages not less than 5.0 mg/l, with a minimum of 4.0 mg/l, and Class SB waters maintain DO levels not less than 4.0 mg/l.

Class GB, or "groundwaters", include all groundwaters of the State, unless classified otherwise, which meet the definition of underground sources of drinking water.

Site specific numeric standards (*) for surface waters may be established by the Department to replace the numeric standards found in Regulation 61-68 or to add new standards not contained in R.61-68. Establishment of such standards shall be subject to public participation and administrative procedures for adopting regulations. In addition, such site specific numeric standards shall not apply to tributary or downstream waters unless specifically described in the water classification listing in R.61-69.

The standards are used as instream water quality goals to maintain and improve water quality and also serve as the foundation of the Bureau of Water's program. They are used to determine permit limits for treated wastewater dischargers and any other activities that may impact water quality. Using mathematical Wasteload Allocation Models, the impact of a wastewater discharge on a receiving stream is predicted. For free flowing streams, 7Q10 is defined as the critical low flow. For highly regulated streams and tidal streams, other more appropriate critical flows may be determined. These predictions are then used to set limits for different pollutants on the National Pollutant Discharge Elimination System (NPDES) permits issued by the Department. The NPDES permit limits are set so that, as long as a permittee (wastewater discharger) meets the established permit limits, the discharge should not cause a standards violation in the receiving stream. All discharges to the waters of the State are required to have an NPDES permit and must abide by those limits, under penalty of law.

Classifications are based on desired uses, not on natural or existing water quality, and are a legal means to obtain the necessary treatment of discharged wastewater to protect designated uses. Actual water quality may not have a bearing on a waterbody's classification. A waterbody may be reclassified if desired or existing public uses justify the reclassification and the water quality necessary to protect these uses is attainable. A classification change is an amendment to a State regulation and requires public participation, SCDHEC Board approval, and General Assembly approval.

Natural conditions may prevent a waterbody from meeting the water quality goals as set forth in the standards. The fact that a waterbody does not meet the specified numeric standards for a particular classification does not mean the waterbody is polluted or of poor quality. Certain types of waterbodies (ie. swamps, lakes, tidal creeks) may naturally have water quality lower than the numeric standards. A waterbody can have water quality conditions below standards due to natural causes and still meet its use classification. A site specific numeric standard may be established by the Department after being subjected to public participation and administrative procedures for adopting regulations. Site specific numeric standards apply only to the stream segment described in the water classification listing, not to tributaries or downstream unspecified waters.

Water Quality Indicators

Water quality data are used to describe the condition of a waterbody, to help understand why that condition exists, and to provide some clues as to how it may be improved. Water quality indicators include physical, chemical, and biological measurements. Copies of the Standard Operating Procedures used for these measurements are available from the Department's Bureau of Water and the Bureau of

Environmental Services. The current State of S.C. Monitoring Strategy is available on our website at www.scdhec.gov/eqc/admin/html/eqcpubs.html#wqreports and describes what parameters are sampled, where they are sampled, and how frequently.

MACROINVERTEBRATE COMMUNITY

Macroinvertebrates are aquatic insects and other aquatic invertebrates associated with the substrates of waterbodies (including, but not limited to, streams, rivers, tidal creeks, and estuaries). Macroinvertebrates can be useful indicators of water quality because these communities respond to integrated stresses over time that reflect fluctuating environmental conditions. Community responses to various pollutants (e.g. organic, toxic, and sediment) may be assessed through interpretation of diversity, known organism tolerances, and in some cases, relative abundances and feeding types.

FISH TISSUE

Many pollutants occur in such low concentrations in the water column that they are usually below analytical detection limits. Over time many of these chemicals may accumulate in fish tissue to levels that are easily measured. By analyzing fish tissue it is possible to see what pollutants may be present in waterbodies at very low levels. This information can also be used to determine if fish consumption poses any undue human health concerns and to calculate consumption rates that are safe.

DISSOLVED OXYGEN

Oxygen is essential for the survival and propagation of aquatic organisms. If the amount of oxygen dissolved in water falls below the minimum requirements for survival, aquatic organisms or their eggs and larvae may die. A severe example is a fish kill. Dissolved oxygen (DO) varies greatly due to natural phenomena, resulting in daily and seasonal cycles. Different forms of pollution also can cause declines in DO.

Changes in DO levels can result from temperature changes or the activity of plants and other organisms present in a waterbody. The natural diurnal (daily) cycle of DO concentration is well documented. Dissolved oxygen concentrations are generally lowest in the morning, climbing throughout the day due to photosynthesis and peaking near dusk, then steadily declining during the hours of darkness.

There is also a seasonal DO cycle in which concentrations are greater in the colder, winter months and lower in the warmer, summer months. Streamflow (in freshwater) is generally lower during the summer and fall, and greatly affects flushing, reaeration, and the extent of saltwater intrusion, all of which affect dissolved oxygen values.

BIOCHEMICAL OXYGEN DEMAND

Five-day biochemical oxygen demand (BOD_5) is a measure of the amount of dissolved oxygen consumed by the decomposition of carbonaceous and nitrogenous matter in water over a five-day period. The BOD_5 test indicates the amount of biologically oxidizable carbon and nitrogen that is present in wastewater or in natural water. Matter containing carbon or nitrogen uses dissolved oxygen from the water as it decomposes, which can result in a dissolved oxygen decline. The quantity of BOD_5 discharged by point sources is limited through the National Pollutant Discharge Elimination System (NPDES) permits issued by the Department. The discharge of BOD_5 from a point source is restricted by the permits so as to maintain the applicable dissolved oxygen standard.

pH

pH is a measure of the hydrogen ion concentration of water, and is used to indicate degree of acidity. The pH scale ranges from 0 to 14 standard units (SU). A pH of 7 is considered neutral, with values less than 7 being acidic, and values greater than 7 being basic.

Low pH values are found in natural waters rich in dissolved organic matter, especially in Coastal Plain swamps and black water rivers. The tannic acid released from the decomposition of vegetation causes the tea coloration of the water and low pH.

High pH values in lakes during warmer months are associated with high phytoplankton (algae) densities. The relationship between phytoplankton and daily pH cycles is well established. Photosynthesis by phytoplankton consumes carbon dioxide during the day, which results in a rise in pH. In the dark, phytoplankton respiration releases carbon dioxide. In productive lakes, carbon dioxide decreases to very low levels, causing the pH to rise to 9-10 SU.

Fecal Coliform Bacteria

Fecal coliform bacteria are present in the digestive tract and feces of all warm-blooded animals, including humans, poultry, livestock, and wild animal species. Fecal coliform bacteria are themselves generally not harmful, but their presence indicates that surface waters may contain pathogenic microbes. Diseases that can be transmitted to humans through water contaminated by improperly treated human or animal waste are the primary concern. At present, it is difficult to distinguish between waters contaminated by animal waste and those contaminated by human waste.

Public health studies have established correlations between fecal coliform numbers in recreational and drinking waters and the risk of adverse health effects. Based on these relationships, the USEPA and SCDHEC have developed enforceable standards for surface waters to protect against adverse health effects from various recreational or drinking water uses. Proper waste disposal or sewage treatment prior to discharge to surface waters minimizes this type of pollution.

Nutrients

Oxygen demanding materials and plant nutrients are common substances discharged to the environment by man's activities, through wastewater facilities and by agricultural, residential, and stormwater runoff. The most important plant nutrients, in terms of water quality, are phosphorus and nitrogen. In general, increasing nutrient concentrations are undesirable due to the potential for accelerated growth of aquatic plants, including algae.

The forms of nitrogen routinely analyzed at SCDHEC stations are ammonia and ammonium nitrogen (NH_3/NH_4), total Kjeldahl nitrogen (TKN), and nitrite and nitrate nitrogen (NO_2/NO_3). Ammonia and ammonium are readily used by plants. TKN is a measure of organic nitrogen and ammonia in a sample. Nitrate is the product of aerobic transformation of ammonia, and is the most common form used by aquatic plants. Nitrite is usually not present in significant amounts. Total nitrogen is the sum of TKN and NO_2/NO_3.

Total phosphorus (TP) is commonly measured to determine phosphorus concentrations in surface waters. TP includes all of the various forms of phosphorus (organic, inorganic, dissolved, and particulate) present in a sample.

CHLOROPHYLL *a*

Nuisance plant growth can create imbalances in the aquatic community, as well as aesthetic and access issues. Rooted aquatic vegetation can clog boat motors and create disagreeable conditions for swimming and water skiing. High densities of microscopic algae (phytoplankton) can cause wide fluctuations in pH and dissolved oxygen, and can cause undesirable shifts in the composition of aquatic life, or even fish kills. Chlorophyll *a* is a dominant photosynthetic pigment in plants and is used as an indicator of the density of phytoplankton in the water column. The process of cultural eutrophication, from increased plant nutrients, is particularly noticeable in lakes. Continuous flushing in streams prevents the development of significant phytoplankton populations and the resultant chemical changes in water quality.

TURBIDITY

Turbidity is an expression of the scattering and absorption of light through water. The presence of clay, silt, fine organic and inorganic matter, soluble colored organic compounds, and plankton and other microscopic organisms increases turbidity. Increasing turbidity can be an indication of increased runoff from land. It is an important consideration for drinking water as finished water has turbidity limits.

TOTAL SUSPENDED SOLIDS

Total Suspended Solids (TSS) are the suspended organic and inorganic particulate matter in water. Although increasing TSS can also be an indication of increased runoff from land, TSS differs from turbidity in that it is a measure of the mass of material in, rather than light transmittance through, a water sample. High TSS can adversely impact fish and fish food populations and damage invertebrate populations. There are no explicit State standards for TSS.

HEAVY METALS

Concentrations of cadmium, chromium, copper, lead, mercury, and nickel in water are routinely measured by the Department to compare to State standards intended to protect aquatic life and human health. These metals occur naturally in the environment, and many are essential trace elements for plants and animals. Human activities, such as land use changes and industrial and agricultural processes have resulted in an increased flux of metals from land to water. Atmospheric inputs are also recognized as important sources of metals to aquatic systems. Metals are released to the atmosphere from the burning of fossil fuels (coal, oil, gasoline), wastes (medical, industrial, municipal), and organic materials. The metals are then deposited on land and in waterways from the atmosphere via rainfall and attached to particulates (dry deposition).

Assessment Methodology

The Watershed Water Quality Assessment is a geographically-based document that describes, at the watershed level, water quality as well as conditions and activities related to water quality. Significant revisions to South Carolina's Water Quality Standards were effective on June 22, 2001. USEPA approved these standards for use in implementing the Clean Water Act on November 28, 2001. This section provides an explanation of the information assessment methodology used to generate the watershed-level summaries. Water quality data summaries used in this assessment are presented in Appendices B-D.

USE SUPPORT DETERMINATION

Physical, chemical and biological data were evaluated, as described below, to determine if water quality met the water quality criteria established to protect the State classified uses defined in S.C. Regulation 61-68, *Water Classifications and Standards*. Some waters may exhibit characteristics outside the appropriate criteria due to natural conditions. Such natural conditions do not constitute a violation of the water quality criteria. To determine the appropriate classified uses and water quality criteria for specific waterbodies and locations, refer to S.C. Regulation 61-69, *Classified Waters*, in conjunction with S.C. Regulation 61-68.

At the majority of SCDHEC's surface water monitoring stations, samples for analysis are collected as surface grabs once per month, quarter, or year, depending on the parameter. Grab samples collected at a depth of 0.3 meters are considered to be a surface measurement. At most stations sampled by boat, dissolved oxygen and temperature are sampled as a water column profile, with measurements being made at a depth of 0.3 meters below the water surface and at one-meter intervals to the bottom or at 0.3 meters, mid-depth, and bottom. At stations sampled from bridges, these parameters are measured only at a depth of 0.3 meters. For the purpose of assessment, only surface samples are used in standards comparisons and trend assessments. Because of the inability to target individual high or low flow events on a statewide basis these data are considered to represent typical physical conditions and chemical concentrations in the waterbodies sampled. All water and sediment samples are collected and analyzed according to standard procedures (SCDHEC 1997, 2001).

Results from water quality samples can be compared to State and USEPA criteria, with some restrictions due to time of collection and sampling frequency. For certain parameters, the monthly sampling frequency employed in the ambient monitoring network is insufficient for strict interpretation of the standards. The USEPA does not define the sampling method or frequency other than indicating that it should be "representative”. The grab sample method is considered to be representative for the purpose of indicating excursions relative to criteria, within certain considerations. A single grab sample is more representative of a one-hour average than a four-day average, more representative of a one-day average than a one-month average, and so on; thus, when inferences are drawn from grab samples relative to criteria, sampling frequency and the intent of the criteria must be weighed. When the sampling method or frequency does not agree with the intent of the particular criterion, any conclusion about water quality should be considered as only an indication of conditions, not as a proven circumstance.

Macroinvertebrate community structure is analyzed routinely at selected stations as a means of detecting adverse biological impacts on the aquatic fauna of the state's waters due to water quality conditions, which may not be readily detectable in the water column chemistry.

This water quality assessment is based on the last complete five years of available quality assured physical, chemical, and biological data (1996 - 2000). Because of the data quality assurance and quality control process outcome, only total phosphorus data collected from 1996 through June 1998 were included in this assessment.

AQUATIC LIFE USE SUPPORT

One important goal of the Clean Water Act, the South Carolina Pollution Control Act, and the State Water Quality Classifications and Standards is to maintain the quality of surface waters to provide for the survival and propagation of a balanced indigenous aquatic community of fauna and flora. The degree to which aquatic life is protected (Aquatic Life Use Support) is assessed by comparing important water quality characteristics and the concentrations of potentially toxic pollutants with numeric criteria.

Support of aquatic life uses is determined based on the percentage of numeric criteria excursions and, where data are available, the composition and functional integrity of the biological community. The term excursion is used to describe a measured pollutant concentration that is outside of the acceptable range as defined by the appropriate criterion. Some waters may exhibit characteristics outside the appropriate criteria due to natural conditions. Such natural conditions do not constitute a violation of the water quality criteria. A number of waterbodies have been given waterbody-specific criteria for pH and dissolved oxygen, which reflect natural conditions. To determine the appropriate numeric criteria and classified uses for specific waterbodies and locations, please refer to S.C. Regulation 61-68, *Water Classifications and Standards* and S.C. Regulation 61-69, *Classified Waters*.

If the appropriate criterion for **dissolved oxygen and pH** are contravened in 10 percent or less of the samples, the criterion is said to be fully supported. If the percentage of criterion excursions is greater than 10 percent, but less than or equal to 25 percent, the criterion is partially supported, unless excursions are due to natural conditions. If there are more than 25 percent excursions, the criterion is not supported, unless excursions are due to natural conditions. The decision that criteria excursions are due to natural conditions is determined by consensus and/or the professional judgment of SCDHEC staff with specific local knowledge.

If the appropriate acute aquatic life criterion for any individual **toxicant (heavy metals, priority pollutants, ammonia)** is exceeded more than once in five years, representing more than 10 percent of the samples collected, the criterion is not supported. If the acute aquatic life criterion is exceeded more than once, but in less than or equal to 10 percent of the samples, the criterion is partially supported. The USEPA criteria to protect aquatic life for most toxicants are specified as a four-day average and a one-hour average, and have been adopted as state criteria. Because samples are collected as grab samples, and because of sampling frequency, comparisons to chronic toxicity criteria (four-day average concentration) are considered inappropriate; therefore, only the acute criterion (one-hour average) for the protection of aquatic life is used in the water quality assessment.

The total recoverable metals criteria for **heavy metals** are adjusted to account for solids partitioning following the approach set forth in the Office of Water Policy and Technical Guidance on Interpretation and Implementation of Aquatic Life Metals Criteria, October 1, 1993, by Martha G. Prothro, Acting Assistant Administrator for Water, available from the Water Resource center, USEPA, 401 M St., SW, mail code RC4100, Washington, DC 20460; and 40CFR131.36(b)(1). Under this approach, a default TSS value of 1 mg/L is used. Where the metals criteria are hardness based, a default value of 25 mg/L is used for waters where hardness is 25 mg/l or less.

If the appropriate criterion for **turbidity** in all waters, and for waters with **numeric total phosphorus, total nitrogen, and chlorophyll-a** criteria is exceeded in more than 25 percent of the samples, the criterion is not supported. If the criterion is exceeded in 25 percent of the samples or less, then the criterion is fully supported.

If the conclusion for any single parameter is that the criterion is "not supported", then it is concluded that aquatic life uses are not supported for that waterbody, at that monitoring location. If there are no criteria that are "not supported", but the conclusion for at least one parameter criterion is "partially supported", then the conclusion is aquatic life uses are partially supported. Regardless of the number of samples, no monitoring site will be listed as partially or not supporting for any pollutant based a single sample result because of the possibility of an anomalous event.

The goal of the standards for aquatic life uses is the protection of a balanced indigenous aquatic community; therefore, biological data is the ultimate deciding factor, regardless of chemical conditions. If biological data shows a healthy, balanced community, the use is considered supported even if chemical parameters do not meet the applicable criteria.

MACROINVERTEBRATE DATA INTERPRETATION

Macroinvertebrate community assessment data are used to directly determine Aquatic Life Use Support and to support determinations based on water chemistry data. Macroinvertebrate community data may also be used to evaluate potential impacts from the presence of sediment contaminants. Aquatic and semi-aquatic macroinvertebrates are identified to the lowest practical taxonomic level depending on the condition and maturity of specimens collected. The EPT Index and the North Carolina Biotic Index are the main indices used in analyzing macroinvertebrate data. To a lesser extent, taxa richness and total abundance may be used to help interpret data.

The EPT Index or the Ephemeroptera (mayflies) - Plecoptera (stoneflies) - Trichoptera (caddisflies) Index is the total taxa richness of these three generally pollution-sensitive orders. EPT values are compared with least impacted regional sites. The Biotic Index for a sample is the average pollution tolerance of all organisms collected, based on assigned taxonomic tolerance values. A database is currently being developed to establish significant EPT index levels to be used in conjunction with the Biotic Index to address aquatic life use support.

Taxa richness is the number of distinct taxa collected and is the simplest measure of diversity. High taxa richness is generally associated with high water quality. Increasing levels of pollution progressively eliminate the more sensitive taxa, resulting in lower taxa richness. Total abundance is the enumeration of all macroinvertebrates collected at a sampling location. When gross differences in abundance occur between stations, this metric may be considered as a potential indicator.

RECREATIONAL USE SUPPORT

Recreational use support is defined as the degree to which the swimmable goal of the Clean Water Act is attained and is based on the frequency of fecal coliform bacteria excursions. A fecal coliform excursion is defined as an occurrence of a bacteria concentration greater than 400/100 ml for all surface water classes. Comparisons to the bacteria geometric mean standard are not considered appropriate based on sampling frequency and the intent of the standard. If 10 percent or less of the samples are greater than 400/100 ml, then recreational uses are said to be fully supported. If the percentage of standards excursions is between 11-25 percent, then recreational uses are said to be partially supported, and if the percentage of excursions is greater than 25 percent, it is considered to represent nonsupport of recreational uses.

FISH CONSUMPTION USE SUPPORT

The Department uses a risk-based approach to evaluate fish tissue data and to issue consumption advisories in affected waterbodies. This approach contrasts the average daily exposure dose to the reference dose (RfD). Using these relationships, fish tissue data are interpreted by determining the consumption rates that would not be likely to pose a health threat to adult males and nonpregnant adult females. Because an acceptable RfD for developmental neurotoxicity has not been developed, pregnant women, infants, and children are advised to avoid consumption of fish from any waterbody where a mercury advisory was issued.

Fish consumption use support is determined by the occurrence of advisories or bans on consumption for a waterbody. For the support of fish consumption uses, a fish consumption advisory indicates partial use support, a consumption ban indicates nonsupport of uses.

DRINKING WATER USE SUPPORT

Nonattainment of drinking water use is indicated if the median concentration of the ambient surface water data for any pollutant exceeds the appropriate drinking water Maximum Contaminant Level (MCL), based on a minimum of three samples. Where MCLs do not exist, SCDHEC may use or develop other criteria such that pollutant concentrations or amounts do not interfere with drinking water use, actual or intended, as determined by SCDHEC.

Additional Screening and Prioritization Tools

Evaluation of water quality data and other supplemental information facilitates watershed planning. Information from the following sources is used to develop watershed-based protection and prevention strategies.

LONG-TERM TREND ASSESSMENT

As part of the watershed water quality assessments, surface data from each station are analyzed for statistically significant long-term trends using the Seasonal Kendall Test Without Correction (SKWOC) for significant serial correlation, using procedures in the WQHYDRO computer package developed by Eric Aroner of WQHYDRO Consulting. Flows are not available for most stations, and the parametric concentrations are not flow-corrected. Seasonal Kendall's tau analysis is used to test for the presence of a statistically significant trend of a parameter, either increasing or decreasing, over a fifteen-year period. It indicates whether the concentration of a given parameter is exhibiting consistent change in one direction over the specified time period. A two sided test at $p=0.1$ is used to determine statistically significant trends, and the direction of trend. An estimate of the magnitude of any statistically significant trend is calculated.

A rigorous evaluation for trends in time-series data usually includes a test for autocorrelation. The data are not tested for autocorrelation prior to the trend analysis. It is felt that autocorrelation would not seriously compromise a general characterization of water quality trends based on such a long series of deseasonalized monthly samples.

One of the advantages of the seasonal Kendall test is that values reported as being below detection limits (DL) are valid data points in this nonparametric procedure, since they are all considered to be tied at the DL value. When the DL changed during the period of interest, all values are considered to be tied at the highest DL occurring during that period. Since it is possible to measure concentrations equal to the value of the DL, values less than DL are reduced by subtraction of a constant so that they remain tied with each other, but are less than the values equal to the DL. Since fecal coliform bacteria detection limits vary with sample dilution, there is no set DL; therefore, for values reported as less than some number, the value of the number is used.

For the purposes of this assessment, long-term trends in selected parameters were examined using data collected from 1986 through 2000. In 1992, a phosphate detergent ban was instituted in South Carolina; therefore, for total phosphorus, a second trend assessment is included for the available data from 1992 through 2000. For total phosphorus, it is this second time period that is reported in the text.

SEDIMENT SCREENING

There are no sediment standards; therefore, in order to identify sediments with elevated metals concentrations, percentiles are constructed using five years of statewide sediment data. Only values greater than the detection limit were used for chromium, copper, nickel, lead, and zinc. Because so few concentrations of cadmium and mercury are measured above the detection limit, all samples were pooled for these metals. A sediment metal concentration is considered to be high if it is in the top 10% of the pooled results, and very high if it is in the top 5%. Any analytical result above detection limits is flagged for pesticides, PCBs, and other priority pollutants. Sites with noted high metals concentrations or the occurrence of other contaminants above detection limits are prioritized for the collection of biological data, or additional monitoring and investigation, to verify the true situation.

For saltwater sediments, national studies have been conducted by the National Oceanic and Atmospheric Administration (NOAA) and the State of Florida that have developed Sediment Quality Guidelines (SQGs) for the United States and the southeastern region. These SQGs summarize all published toxicology and biomonitoring studies for a given contaminant and ranked them from lowest to highest concentration where an adverse effect was observed. The tenth percentile of the ranked data, from all published studies that reported an adverse effect, is termed the Effects Range Low (ERL) or Threshold Effects Level (TEL) and represents the threshold concentration for toxicity to occur. The median concentration where adverse effects in benthos are observed (the fiftieth percentile) is termed the Effects Range Median (ERM) or Probable Effects Levels (PEL). Measured sediment contaminant levels may be compared with ERLs/ERMs or TELs/PELs to predict potential probability for sediment bound contaminants to cause toxicity in benthic faunal communities. Saltwater sediment contaminant levels were compared with existing sediment quality guidelines by both individual compound. Sites with sediments which had individual chemical contaminant concentrations which exceeded ERL/TEL and ERM/PEL guideline levels are identified to indicate that trace metal, pesticide, PAH or PCB concentrations exceeded levels potentially toxic to estuarine organisms.

Groundwater Quality

The state of South Carolina depends upon its groundwater resources to supply an estimated 40 percent of its residents. To monitor the ambient quality of this valuable resource, a network of existing public and private water supply wells has been established that provides groundwater quality data representing all of the State's major aquifers. A great deal of monitoring is also being carried out at regulated sites with known or potential groundwater contamination (see SCDHEC's South Carolina Groundwater Contamination Inventory).

The ambient monitoring network has been designed to avoid wells in areas of known or potential contamination in order to analyze natural aquifer conditions. Information collected can then be used to identify variations in water chemistry among the major aquifers of South Carolina and give a general understanding of the groundwater conditions throughout the state at varying depths.

Wells sampled in the Savannah River Basin were drilled into one of three major aquifers. From Aiken county northwest to the mountains in Oconee County, the Piedmont Bedrock is the prevailing aquifer. Lying directly over this is the Saprolite Aquifer. The Middendorf Aquifer is the dominant aquifer running from the Fall Line, the physiographic regional divider between the Piedmont and Coastal Plain regions, towards the sea. All well samples met state standards for Class GB groundwater (see section on Classified Waters, Standards, and Natural Conditions). The ambient monitoring well sites are indicated in the appropriate watershed evaluations and depicted on the watershed maps.

PIEDMONT BEDROCK AQUIFER

Groundwater supplies in the Piedmont region of South Carolina come from one of two sources.

These include the unweathered fractured bedrock and the overlying weathered bedrock (saprolite). The majority of wells are completed in the fractured bedrock, which varies widely from granites to metamorphic gneisses. The water characteristics also can vary widely; however, it is possible to make some broad statements about groundwater conditions in the Piedmont.

Water pumped from the Piedmont Bedrock Aquifer tends to be slightly acidic, ranging in pH from 5.1 to 7.0. It also tends to be soft, having very little dissolved calcium and magnesium, and falls well within the acceptable hardness range of 50 to 150 mg/l. The host rock also is either insoluble or dissolves very slowly, so the water pumped from this rock is relatively low in total dissolved solids, and falls well below the maximum limit of 500 mg/l.

SAPROLITE AQUIFER

Although the majority of South Carolina's piedmont groundwater supplies come from the Piedmont Bedrock Aquifer, the overlying saprolite, consisting mainly of clay to sandy soils, is a significant water-producing unit. This saprolite layer can be absent in some areas and up to 150 feet thick others. Because it is an in-place weathering product, the soils maintain many of their original structures, such as fractures, dikes, and foliations, and these structures act as paths for groundwater flow.

The sampling network was developed to include paired wells in the piedmont. These wells are close in vicinity to one another, and one is drilled into the Piedmont Bedrock Aquifer and one into the Saprolite Aquifer. These paired wells are used to analyze the development of groundwater chemistry as water slowly percolates down through overlying saprolite into the basement rock. It seems that variations between these two aquifers are minute with few distinctions. Generally, the water is soft, acidic, and low in dissolved solids. There is a slight increase in dissolved silica in the bedrock due to the slow addition of silica into the water as it seeped through the saprolite.

MIDDENDORF AQUIFER

The Middendorf Aquifer directly overlies the bedrock and stretches from the Fall Line, where it outcrops, to the Atlantic coast, where it exceeds depths of 3000 feet. In the coastal plain region of the Savannah River Basin, the Middendorf Aquifer is the main provider of groundwater to numerous private and public wells. It is generally composed of fairly coarse sands and therefore is capable of yielding considerable amounts of water.

The sands that make up the Middendorf Aquifer are typically clean, containing relatively few heavy minerals or organics. The water is generally leached of most minerals and approaches the chemistry of distilled water. It is similar to the water previously discussed in the Piedmont Bedrock and Saprolite Aquifer sections. There is a tendency for water in the Middendorf Aquifer to be soft, acidic, and low in dissolved solids, with locally high iron content. This tendency changes toward the coast, due to minute amounts of minerals that slowly dissolve in the water as it ages. As it reaches the coastal areas, the concentration is high enough to affect the water quality; however, the Middendorf Aquifer now lies beneath waters of similar quality and more easily reached aquifers.

NPDES Program

The Water Facilities Permitting Division and the Industrial, Agricultural, and Stormwater Permitting Division are responsible for drafting and issuing National Pollutant Discharge Elimination System (NPDES) permits. Facilities are defined as either "major" or "minor". For municipal permits, a facility is considered a "major" if it has a permitted flow of 1 MGD or more and is not a private facility. The determination for industrial facilities is based on facility and stream characteristics, including toxicity, amount of flow, load of oxygen, proximity of drinking water source, potential to exceed stream standards, and potential effect on coastal waters.

Permitting Process

A completed draft permit is sent to the permittee, the SCDHEC District office, and if it is a major permit, to the USEPA for review. A public notice is issued when the permit draft is finalized. Comments from the public are considered and, if justified, a public hearing is arranged. Both oral and written comments are collected at the hearing, and after considering all information, the Department staff makes the decision whether to issue the permit as drafted, issue a modified permit, or to deny the permit. Everyone who participated in the process receives a notice of the final decision. A copy of the final permit will be sent to anyone who requests it. Staff decisions may be appealed according to the procedures in R.61-72 and the rule of the Administrative Law Judge Division of South Carolina.

The permitting Divisions use general permits with statewide coverage for certain categories of discharges. Discharges covered under general permits include utility water, potable surface water treatment plants, potable groundwater treatment plants with iron removal, petroleum contaminated groundwater, mine dewatering activities, aquaculture facilities, bulk oil and gas terminals, hydrostatic test waters (oil & gas lines), and vehicle wash waters. Additional activities proposed for general permits include ready-mix concrete/concrete products and concentrated animal feeding operations. State Land application systems for land disposal and lagoons are also permitted.

Wasteload Allocation Process

A wasteload allocation (WLA) is the portion of a stream's assimilative capacity for a particular pollutant that is allocated to an existing or proposed point source discharge. Existing WLAs are updated during the basin review process and included in permits during the normal permit expiration and reissuance process. New WLAs are developed for proposed projects seeking a discharge permit or for existing discharges proposing to increase their effluent loading at the time of application. Wasteload allocations for oxygen demanding parameters and nutrients are developed by the Water Quality Modeling Section, and WLAs for toxic pollutants and metals are developed by the appropriate permitting division.

The ability of a stream to assimilate a particular pollutant is directly related to its physical and chemical characteristics. Various techniques are used to estimate this capacity. Simple mass balance/dilution calculations may be used for a particular conservative (nondecaying) pollutant while complex models may be used to determine the fate of nonconservative pollutants that degrade in the environment. Waste characteristics, available dilution, and the number of discharges in an area may, along with existing water quality, dictate the use of a simple or complex method of analysis. Projects that generally do not require complex modeling include: groundwater remediation, noncontact cooling water, mine dewatering, air washers, and filter backwash.

Streams are designated either “effluent limited” or “water quality limited” based on the level of treatment required of the dischargers to that particular portion of the stream. In cases where the USEPA published effluent guidelines and the minimum treatment levels required by law are sufficient to maintain instream water quality standards, the stream is said to be effluent limited. Streams lacking the assimilative capacity for a discharge at minimum treatment levels are said to be water quality limited. In cases where better than technology limits are required, water quality, not minimum requirements, controls the permit limits. The Department's Water Quality Modeling Section recommends limits for numerous parameters including ammonia nitrogen (NH_3-N), dissolved oxygen (DO), total residual chlorine (TRC), and five-day biochemical oxygen demand (BOD_5). Limits for other parameters, including metals, toxics, and nutrients are developed by the Water Facilities Permitting Division or the Industrial, Agricultural, and Stormwater Permitting Division in conjunction with support groups within the Department.

Nonpoint Source Management Program

Nonpoint source (NPS) water pollution, sometimes called “runoff pollution” or “polluted runoff” does not result from a discharge at a specific, single location (or point), but generally comes from diffuse, numerous sources. Runoff occurring after a rain event may transport sediment from plowed fields, construction sites, or logging operations, pesticides and fertilizers from farms and lawns, motor oil and grease deposited on roads and parking lots, or bacteria containing waste from agricultural animal facilities or malfunctioning septic systems. The rain moves the pollutants across the land to the nearest waterbody or storm drain where they may impact the water quality in creeks, rivers, lakes, estuaries, and wetlands. NPS pollution may also impact groundwater when it is allowed to seep or percolate into aquifers. Adverse effects of NPS pollution include physical destruction of aquatic habitat, fish kills, interference with or elimination of recreational uses of a waterbody (particularly lakes), closure of shellfish beds, reduced water supply or taste and odor problems in drinking water, and increased potential for flooding because waterbodies become choked with sediment.

Congress recognized the growing problem of nonpoint source pollution in the late 1980s, and added NPS provisions to the federal law. Section 319 of the 1987 Amendments to the Clean Water Act required states to assess the nonpoint source water pollution associated with surface and groundwater within their borders and then develop and implement a management strategy to control and abate the pollution. The first Assessment of Nonpoint Source Pollution in South Carolina accomplished this purpose. The Department’s Bureau of Water manages the ongoing State NPS Management Program, which develops strategies and targets waterbodies for priority implementation of management projects. Section 319 funds various voluntary efforts, including watershed projects, which address many aspects of the pollution prevention management measure and provide education, outreach and technical assistance to various groups and agencies. Most of the projects are implemented by cooperating agencies.

Many land activities can individually or cumulatively contribute to NPS pollution. Eight categories of NPS pollution sources have been identified as contributing to water quality degradation in

South Carolina: agriculture, forestry, urban areas, marinas and recreational boating, mining, hydrologic modification, wetlands and riparian areas disturbance, land disposal, and groundwater contamination. There are programs, both regulatory and voluntary, in-place that address all eight categories.

Agriculture

In South Carolina, pesticides, fertilizers, animal waste, and sediment are potential sources of agricultural NPS pollution. Agricultural activities also have the potential to directly impact the habitat of aquatic species through physical disturbances caused by livestock or equipment, and through the management of water. The State has laws and regulations that prevent NPS pollution from several agricultural sources including pesticides and animal waste. Funding programs including those under §319 grants from EPA, cost share funds from USDA under EQIP and CRP are used to implement best management practices that are not covered under regulations. Agriculture land acreage is quantified in the basin-wide and individual watershed evaluations.

Silviculture

Forests comprise a major portion of South Carolina’s land base. Sixty-six percent, or 12.6 million acres, of the State’s total land area is in timberland. Silvicultural practices associated with road access, harvest, and regeneration of timber present the most significant potential for NPS pollution. Silvicultural activities have the potential to degrade the State’s waters through the addition of sediment, nutrients, organics, elevated temperature, and pesticides. Erosion and subsequent sedimentation are the most significant and widespread NPS problems associated with forestry practices. Sudden removal of large quantities of vegetation through harvesting or silvicultural practices can also increase leaching of nutrients from the soil system into surface waters and groundwaters. Programs to abate or control NPS pollution from forestry activities are primarily the responsibility of the S.C. Forestry Commission (SCFC) and the United States Department of Agriculture’s Forest Service (USFS), with other agencies having supplementary programs. S.C. Forestry Commission provides monthly courtesy exams to SCDHEC’s Division of Water Quality and to forest industries. If water quality was impacted by a forestry operation, SCDHEC may institute enforcement action under the South Carolina Pollution Control Act. The United States Department of Agriculture’s Natural Resources Conservation Service (USDA-NRCS) also provides technical assistance to government, landowners, and land users. Forest land acreage is quantified in the basin-wide and individual watershed evaluations.

Urban Areas

Urbanization has been linked to the degradation of urban waterways. The major pollutants found in runoff from urban areas include sediment, nutrients, oxygen-demanding substances, heavy metals, petroleum hydrocarbons, pathogenic bacteria, and viruses. Suspended sediments constitute the largest mass of pollutant loadings to receiving waters from urban areas. Construction sites are a major source of sediment erosion. Nutrient and bacterial sources of contamination include fertilizer usage, pet wastes, leaves, grass clippings, and faulty septic tanks. Petroleum hydrocarbons result mostly from automobile sources. In the 1980's, the average statewide population growth was 11.7 percent, while the coastal counties had an increase of 22 percent, nearly double the State rate during the same time period. This continuing development and population growth has the potential to make urban runoff the most significant source of pollution in waters of the State in the future. Urban land acreage is quantified in the basin-wide and individual watershed evaluations.

SCDHEC has a number of statewide programs that address components of urban NPS pollution. The Bureau of Water administers four permitting programs that control runoff from new and existing urban sources. These include the Stormwater and Sediment Reduction program, Municipal Separate Storm Sewer System (MS4), Industrial NPDES Stormwater Permits, and the §401 water quality certification program (see p.26). Additional controls for urban runoff in the coastal zone are implemented by SCDHEC's Oceans and Coastal Resources Management (OCRM) through the State Coastal Zone Management Plan.

SCDHEC's Bureau of Environmental Health's Division of Onsite Wastewater Management administers the Onsite Sewage Disposal System program for the entire State, and oversees the permitting for the installation and management of septic systems. Although not associated with urban land use, this Division permits the septic systems of camping facilities if the facility is not on public sewer. The camp sewage is discharged into a public collection, treatment and disposal system if available, or an onsite wastewater treatment and disposal system (septic tank) is used.

Marinas and Recreational Boating

Potential adverse environmental impacts associated with marinas include dissolved oxygen deficiencies, high concentrations of toxic metals in aquatic organisms, and the potential to cause bacterial contamination of shellfish harvesting areas. In addition, marina construction activities can lead to the physical destruction of sensitive ecosystems and bottom-dwelling aquatic communities. Presently, there are more than 100 marinas in South Carolina, with 68 of them in the coastal zone. The U.S. Army Corps of Engineers and the SCDHEC are responsible for permitting marinas in South Carolina. Within SCDHEC, the two offices that have marina permitting authority are the Office of Ocean and Coastal Resource Management (SCDHEC OCRM) and the Office of Environmental Quality Control (SCDHEC Bureau of Water). SCDHEC OCRM issues critical area permits for marinas within the critical area of the coastal zone. SCDHEC Bureau of Water issues permits for marinas at all other locations within the State and issues §401 Water Quality Certifications (see p.26) for marinas statewide. The U.S. Coast Guard and the S.C. Department of Natural Resources are responsible for managing recreational boating activity.

Mining

South Carolina's mineral production consists of non-fuel minerals that provide raw materials for construction products and a precious metal industry. Portland cement clays (kaolin and brick), sand and gravel, and crushed stone represent the majority of the total mineral value. At the end of FY 2001-2002, there were 540 mining operations in South Carolina affecting more than 23,000 acres. Surface mining has the potential to generate NPS pollution during mineral exploration, mine development extraction, transportation, mining and processing, product storage, waste disposal, or reclamation. Potential nonpoint source impacts related to mining activities generally include hydrologic modification, erosion and sedimentation, water quality deterioration, fish and wildlife disturbances, and public nuisances.

The Department's Bureau of Land and Waste Management has primary regulatory responsibility for mining activities. Within the Bureau, the Division of Mining and Solid Waste Permitting is responsible for administering and implementing the S.C. Mining Act and its associated regulations. The Mining Act serves as part of an overall management plan for NPS pollution from active mines. Mining activities and locations are identified in the appropriate watershed evaluations.

Hydromodification

Hydrologic modification (or hydromodification) is defined as stream channelization, channel modification, and dam construction. These activities can negatively impact water quality, destroy or modify in-stream habitat and increase streambank and shoreline erosion. Two State permits, implemented by the SCDHEC, are involved in the implementation of management measures for hydromodification. A critical area permit is required for coastal waters, saltwater wetlands, and beaches defined as critical areas. A navigable waters permit is required for the remainder of the State. Implementation of State policy for dam construction is similar to control of other hydromodification projects in South Carolina, requiring the same State permits and certifications. In addition, dams require a State dam safety permit or a State stormwater management and sediment reduction permit. The Department must also issue Water Quality Certifications pursuant to §401 of the Federal Clean Water Act for dam construction and hydropower operations licensed by the Federal Energy Regulatory Commission.

Wetlands

Twenty-three percent of South Carolina is covered by 4.5 million acres of wetlands. The U.S. Army Corps of Engineers implements the federal program for regulating development in wetlands with guidelines established by EPA. The Corps delineates wetlands and determines which wetlands fall under regulatory jurisdiction and require a federal permit for development. The Wetlands Reserve Program, administered by the NRCS, is designed to restore and protect wetlands. At the state level, the primary focus of wetland regulation is the §401 Water Quality Certification. In the §401 certification process, applications for wetland alterations may be denied or modified due to the special nature of a wetland or the functions that a wetland provides. Wetland impacts must be compensated through restoration, enhancement, preservation, or creation and protected in perpetuity. Future development would be prohibited in these mitigated and legally protected areas. Knowledge of areas that are restricted from development due to mitigation or special water classification is useful in planning future development in a watershed. Wetland acreage is quantified in the basin-wide and individual watershed evaluations.

Land Disposal

Although modern solid waste disposal sites are considered point sources of pollution and regulated, leachate from sanitary landfills and dumps have the potential to pollute large portions of adjacent groundwater aquifers. Toxic compounds are commonly a part of the overall composition of landfill leachate, especially when the landfill has been used for the disposal of toxic chemicals. There are currently 140 permitted landfills in South Carolina. This total represents 35 municipal solid waste landfills (MSWLF), 62 industrial waste landfills, 41 construction and demolition (C&D) landfills, one sludge monofill, and one ash monofill. Regulatory authority over solid waste disposal activities resides with SCDHEC's Bureau of Land and Waste Management. All active and closed industrial and municipal solid waste landfills are identified in the appropriate watershed evaluations.

Land application of wastewater or its by products is a form of recycling because it allows recovery of elements needed for crop production. Land application of biosolids may be beneficial and environmentally sound when applied at the correct agronomic rate. Land applying biosolids can benefit farmers by offsetting the costs of fertilizer and lime while reducing the pressure on existing landfills. SCDHEC's Bureau of Water, Division of Water Monitoring, Assessment and Protection, Groundwater Quality Section conducts a program to prevent, monitor, and correct groundwater contamination from nonpoint source pollution from land application of wastewater biosolids, solids, animal manures, biosolids, and sewage sludge. Land application, which is not a discharge, requires a "no discharge" permit (ND). All active industrial and municipal land applications are identified in the appropriate watershed evaluations.

Groundwater Contamination

All aquifers in the State are potential Underground Sources of Drinking Water and are protected under the S.C. Water Classifications and Standards. Groundwaters are thus protected in a manner consistent with the SCDHEC groundwater protection strategy. Staff hydrogeologists implement a screening program for nonpoint source impacts from pits, ponds, and lagoons associated with the permitted storage, treatment, and disposal of industrial and municipal wastewaters. In cases where a groundwater impact has been identified in violation of S.C. Water Classifications and Standards, appropriate actions will be coordinated with the facility owner to ensure regulatory compliance. The hydrogeologist coordinates with the facility owner to implement source identification, contaminant extent assessments, initiation of contaminant remediation systems, and performance evaluations of corrective actions. In addition to releases from wastewater treatment systems, the staff evaluates releases from other nonpoint sources such as above ground tanks, nonregulated fuel oil tanks, spills and/or leaks. Sites with confirmed groundwater impact will be placed under a Consent Agreement or an Order. SCDHEC's South Carolina Groundwater Contamination Inventory quantifies the status of groundwater quality in South Carolina. The sites in the inventory are known groundwater contamination cases in the State, and are referenced by name and county, and updated annually.

Water Quantity

Water treatment facilities are permitted by the Department for municipal and industrial potable water production. As per the 2000 Groundwater Use and Reporting Act and 2000 South Carolina Surface Water Withdrawal and Reporting Act, all water uses over 3 million gallons in any month must report their annual usage by month. This includes activities such as industrial, agricultural, mining, golf courses, public supply, hydropower, thermo power, and nuclear power. The volume of surface water removed from a stream is identified in the watershed evaluations for municipal (potable) uses.

Interbasin Transfer of Water

According to The State Interbasin Transfer of Water Act, an interbasin transfer of water permit is required when any entity desires to withdraw, divert, pump, or cause directly the transfer of either 5% of the 7Q10 (seven day, ten year low flow), or one million gallons or more of water a day on any day, whichever is less, from one river basin and use or discharge all or any part of the water in a different river basin. The SCDHEC Board is empowered to negotiate agreements, accords, or compacts on behalf of and in the name of the State of South Carolina with other states or the United States, or both, with any agency, department, or commission of either, or both, relating to transfers of water that impact waters of this State, or are connected to or flowing into those waters. The Board is further empowered to represent this State in connection with water withdrawals, diversions, or transfers occurring in other states, which may affect this State.

Capacity Use Program

As authorized under the Groundwater Use and Reporting Act, the Department may declare a capacity use area if the resource is threatened by increasing demand or the potential problems of saltwater intrusion. The Capacity Use Program requires large groundwater users to obtain a permit in capacity use areas. Permits are required for groundwater withdrawn in excess of 3 million gallons in a month. Permit owners are required to report the amount of groundwater withdrawn per month on an annual basis. As part of the Capacity Use Program, the Department monitors a large number of wells to determine the relationship between water levels and pumpage in order to determine regional impacts and evaluate reserve supply. A reserve supply is maintained to offset drought conditions. Jasper County makes up the Low Country Capacity Use Area in the Savannah River Basin.

Growth Potential and Planning

Land use and management can define the impacts to water quality in relation to point and nonpoint sources. Assessing the potential for an area to expand and grow allows for water quality planning to occur and, if appropriate, increased monitoring for potential impairment of water quality. Indicators used to predict growth potential include water and sewer service, road and highway accessibility, and population trends. These indicators and others were used as tools to determine areas within the Savannah River Basin having the greatest potential for impacts to water quality as a result of development.

SCDHEC's Strategic Plan for 2000-2005 (www.scdhec.gov/news/releases/pdf files/Stratpln.pdf) acknowledges that growth issues are best handled at the local government level. SCDHEC's role is to work with local governments and communities to help them understand the importance of planning for smart growth: buffers, greenspaces, mass transit, subdivision and roadway planning, bike paths and bike lanes, and park and ride lots. SCDHEC can also provide assistance in helping local entities access information and provide consultation on technical issues such as the establishment of buffers and watershed stormwater planning. Many counties in the Savannah River Basin lack county wide zoning ordinances; therefore, there is little local regulatory power to influence the direction or magnitude of regional growth. The majority of municipalities have zoning ordinances in place; however, much of the growth takes place just outside the municipal boundaries, where infrastructure is inadequate. Section 208 of the Clean Water Act serves to encourage and facilitate the development and implementation of areawide waste treatment management plans. The §208 Areawide Water Quality Management Plans were completed in great detail during the 1970's and have recently been updated. Information from the updated reports is used in the individual watershed evaluations. South Carolina’s water quality management plans support consolidation of wastewater treatment facilities into larger regional systems.

Watershed boundaries extend along topographic ridges and drain surrounding surface waters. Roads are commonly built along ridge tops with the best drainage conditions. Cities often develop in proximity to ridges as a result of their plateau terrain. It is not uncommon, then, to find cities or road corridors located along watershed boundaries, and thus influencing or impacting several watersheds.

Watershed Protection and Restoration Strategies

SCDHEC's Bureau of Water is responsible for ensuring that South Carolina's water is safe for drinking and recreation, and suitable to support aquatic life. This section provides an overview of other important Bureau programs and strategies applied statewide to protect and restore water quality. The point and nonpoint source controls described previously assist with achieving these goals.

Under §303(d) of the Federal Clean Water Act, each state is required to provide a comprehensive inventory of impaired waters for which existing required pollution controls are not stringent enough to achieve State water quality standards or Federal Clean Water Act goals. This biennial list, commonly referred to as the "303(d) list", is the basis for targeting waterbodies for watershed-based solutions. A copy of the current §303(d) list can be obtained by contacting the Bureau of Water. Several Bureau programs address these impaired streams in an effort to restore them.

Total Maximum Daily Load

A Total Maximum Daily Load (TMDL) is the calculated maximum allowable pollutant loading to a waterbody at which water quality standards are maintained. A TMDL is made up of two main components, a load allocation and a wasteload allocation. A load allocation is the portion of the receiving water's loading capacity attributed to existing or future nonpoint sources or to natural background sources. The waste load allocation is the portion of a receiving water's loading capacity allocated to an existing or future point source.

A TMDL is a means for recommending controls needed to meet water quality standards in a particular water or watershed. Historically, the typical TMDL has been developed as a wasteload allocation, considering a particular waterbody segment, for a particular point source, to support setting effluent limitations. In order to address the combined cumulative impacts of all sources, broad watershed-based TMDLs are now being developed.

The TMDL process is linked to all other State water quality activities. Water quality impairments are identified through monitoring and assessment. Watershed-based investigations result in source identification and TMDL development. TMDLs form links between water quality standards and point and nonpoint source controls. Where TMDLs are established, they constitute the basis for NPDES permits and for strategies to reduce nonpoint source pollution. The effectiveness and adequacy of applied controls are evaluated through continued monitoring and assessment.

Funding for TMDL implementation is currently available with USEPA's §319 of the Clean Water Act grants. For more information, see the Bureau of Water web page www.scdhec.gov/water or call the Watershed Program at (803) 898-4300.

Antidegradation Implementation

The State's Antidegradation Policy as part of S.C. Regulation 61-68 is represented by a three-tiered approach to maintaining and protecting various levels of water quality and uses; streams included on the 303(d) list are addressed under Tier 1. Tier 1 antidegradation policies apply to all waters of the State and require that existing uses and the minimum level of water quality for those uses be maintained and protected. Tier 2 policies apply to high quality water where the water quality exceeds the mandatory minimum levels to support the Clean Water Act's goals of propagation of fish, shellfish, wildlife, and recreation in and on the water. The Department considers all the waters of the State as high quality waters. Tier 3 policies apply to the maintenance of water quality in waters that constitute an Outstanding National Resource Water and do not allow for any permanent permitted dischargers. Outstanding Resource Waters of the State are provided a higher level of protection than Tier 2, but do not meet the requirements of Tier 3.

Tier 1 protection will be implemented when applying numeric standards included in Regulation 61-68 for human health, aquatic life, and organoleptic protection as follows: if a waterbody has been affected by a parameter of concern causing it to be on the §303(d) list, then the Department will not allow a permitted net increase of loading for the parameter of concern unless the concentration will not contribute to a violation of water quality standards. This no net increase will be achieved by reallocation of existing total load(s) or by meeting applicable water quality standard(s) at the end-of-pipe. No discharge will be allowed to cause or contribute to further degradation of a §303(d) listed waterbody.

The Antidegradation Rules apply to both nonpoint source pollution and for point sources into impaired waters. Many activities contributing to nonpoint source pollution are controlled with voluntary measures. The Department implements permitting or certification programs for some of these activities and has the opportunity to ensure compliance with the Antidegradation Rules. The activities of primary concern are land development projects which are immediately adjacent to and discharge runoff or stormwater into impaired waters.

401 Water Quality Certification Program

If a Federal permit for a discharge into waters of the State, including wetlands, is required, the Department must issue Water Quality Certification pursuant to §401 of the Federal Clean Water Act. Certification is required for permits issued by the U.S. Army Corps of Engineers for construction in navigable waters and for deposition of dredged or fill material.

Regulation 61-101 presents administrative and technical guidance for the water quality certification program and requires SCDHEC to consider whether or not a project is water dependent; whether or not there are feasible alternatives which will have less adverse consequences on water quality and classified uses; the intended purpose of the project; and all potential water quality impacts of the project, both direct and indirect, over the life of the project. Any project with the potential to affect waters of the State must be conducted in such a manner to maintain the specified standards and classified and existing water uses.

As a routine part of the §401 Water Quality Certification review process, the waterbody in question is identified as impaired or not impaired according to the §303(d) list. If it is impaired, the parameter of concern is noted, along with any steps required to prevent further degradation of the water quality of that waterbody. In an effort to facilitate watershed restoration where appropriate, mitigation for unavoidable wetland impacts is encouraged in areas that improve §303(d) listed waters.

Stormwater Program

Stormwater discharges result from precipitation during rain events. Runoff washes pollutants associated with industrial activities (including construction activity), agricultural operations, and commercial and household sites directly into streams, or indirectly into drainage systems that eventually drain into streams. The SCDHEC Stormwater Permitting Program focuses on pollution prevention to reduce or eliminate stormwater pollution. The Department has general permitting authority for stormwater discharges associated with industrial activity, including construction. General NPDES permits SCR000000 and SCR100000 for industrial and construction activities, respectively, require permittees to develop and implement stormwater pollution prevention plans that establish best management practices to effectively reduce or eliminate the discharge of pollutants via stormwater runoff. The Stormwater and Agricultural Permitting Section is responsible for issuing NPDES stormwater permits to prevent degradation of water quality as well as for issuing state sediment and erosion control permits for construction sites. The NPDES permit are issued under the authority of the federal Clean Water Act and the South Carolina Pollution Control Act. The state sediment and erosion control permits are issued under the authority of two South Carolina laws. The South Carolina Erosion and Sediment Reduction Act of 1983 addresses construction on state owned or managed land. The South Carolina Stormwater Management and Sediment Reduction Act of 1991 addresses construction on land that is not state owned or managed. Currently, NPDES permits are required for: construction sites 1 acre and greater; construction sites in the coastal area that are within 1/2 mile of a receiving water body; and construction sites less than 1 acre on a case-by-case basis where water quality is a concern. Permits are required under the state sediment and erosion control for construction sites that are greater than 2 acres. The state sediment and erosion program is somewhat duplicative of the NDPES Stormwater Program. The state program created by the 1991 Act can be delegated to local governments. Until a local government becomes delegated, SCDHEC's Office of Ocean and Coastal Resource Management is delegated the State Sediment and Erosion Control Program in the coastal area. The Stormwater and Agricultural Permitting Section manages the NPDES Stormwater Program in all areas of the state and the State Sediment and Erosion Control Program in the areas of the state where the program is not delegated to another entity.

Regulation 61-9 requires a compilation of all existing State water quality data with STORET data being used as a baseline. If analysis indicates a decrease in water quality then corrective measures must be taken. The permittee will identify all impaired water bodies in a Stormwater Management Plan (SWMP). In addition, existing pollution discharge control methods will be identified and incorporated into the SWMP. Procedures, processes, and methods to control the discharge of pollutants from the municipal separate storm sewer system (MS4) into impaired waterbodies and publicly owned lakes included on the §303(d) list will be described in the SWMP. The effectiveness of these controls will be assessed and necessary corrective measures, if any, shall be developed and implemented.

Permits for municipal systems allow communities to design stormwater management programs that are suited for controlling pollutants in their jurisdiction. There are three population-based categories of municipal separate storms sewers: large municipal (population of 250,000 or greater), medium municipal (population of 100,000 or more but less than 250,000), and small municipal (population less than 100,000). Large and medium MS4s have been regulated since the 1990s. Those small MS4s within the boundaries of an urbanized area are called Regulated Small MS4s and were required to submit MS4 NPDES applications on or before March 10, 2003. MS4 NPDES Permits are required for all large, medium, and regulated small MS4s.

South Carolina Animal Feeding Operations Strategy

Among the general categories of pollution sources, agriculture ranks as the number one cause of stream and lake impairment nationwide. Many diseases can potentially be contracted from drinking water or coming into contact with waters contaminated with animal wastes. The Department uses S.C. Regulation 61-43: *Standards for the Permitting of Agricultural Animal Facilities* to address the permitting of animal feeding operations (AFOs). Implementing these regulations and their corresponding compliance efforts are a priority for the Department in order to reduce public health and environmental impacts from AFOs. There are approximately 1,100 active AFOs in SC. While previously, there were no federally defined concentrated animal feeding operations (CAFOs) in operation in South Carolina, EPA modified the definition of a CAFO in the NPDES regulations in December 2002. These regulations will now be adopted in SC. Based on the new federal CAFO definition, SC will have approximately 200 CAFOs that will require NPDES permits. Using the Watershed Program cycle and the division of the State into five regions, AFOs will be monitored and inspected by region. The §303(d) list will be used to prioritize the inspections. After all the inspections have been made in a region, the Department will move to the river basins in the next region in the watershed cycle. The Department is continuing to work in cooperation and coordination with the U.S. Department of Agriculture, the Natural Resources Conservation Service, the S.C. Department of Agriculture, the S.C. Soil and Water Conservation Districts, and the Clemson Extension Service.

Sanitary Sewer Overflow Strategy

Sanitary sewers are designed to collect municipal and industrial wastewater, with the allowance for some acceptable level of infiltration and inflow, and transport these flows to a treatment facility. When the sewer system is unable to carry these flows, the system becomes surcharged and an overflow will occur. Sanitary sewer overflows (SSOs) have existed since the introduction of separate sanitary sewers, and most are caused by inadequate operation, maintenance, and management of the collection system.

The Department encourages utilities to embrace the principals of EPA’s capacity Management, Operations, and Maintenance (cMOM) program. Through this program utilities can ensure adequate funding and capacity as well as a proactive approach to operations and maintenance. Those that have implemented cMOM programs have been able to significantly reduce or eliminate overflows from their collection systems. Additionally, the Department has adopted requirements for operation and maintenance of sewer systems in Regulation 61-9, Water Pollution Control Permits.

The Department’s approach has been to shift resources historically applied to treatment plant inspections to include evaluations of pump stations and collection systems where problems are suspected. To assist evaluators in identifying water quality violations related to SSOs, staff have utilized the 303(d) list of impaired waters to identify waters impacted by fecal coliform or other appropriate pollutants and correlate those with collection systems with incidences of SSOs. The Department's Enforcement Referral Procedures Document is be used to determine when a collection system should be referred to enforcement for SSOs. The enforcement process allows for the Department to consider actions taken by the collection system such as: timely and proper notification, containment and mitigation of discharge, voluntarily conducting self evaluations, and requests for compliance assistance. The Department will take immediate action where it has been determined that SSOs have occurred and the collection system has not made timely and proper notification.

Referral Strategy for Effluent Violations

The Department has developed referral effluent violation guidelines to specifically address discharges into impaired waters. The goal of the referral guidelines is to reduce pollutant discharges into impaired waters in order to ultimately restore them to their full potential usage. To achieve this goal, enforcement actions are initiated earlier in an effort to improve the quality of waters that do not meet standards. If a stream is impaired by a pollutant and the permit limit for that pollutant is exceeded more than once in a running annual reporting period, formal enforcement action will be initiated against the discharger.

SCDHEC's Watershed Stewardship Programs

Public participation is an important component of the Department's Watershed Water Quality Management Program. Benefits to this interaction on the local level include improved public awareness about SCDHEC water programs, and increased local interest and participation in water quality improvement. Described below are some of the Department's water programs that encourage public interest and involvement in water quality. These programs and their contacts are listed on the Department's website at www.scdhec.gov/water.

Source Water Assessment Program

A safe, adequate source of drinking water is key to development of communities and the health of citizens. The Safe Drinking Water Act (SDWA) provides authority to protect sources of drinking water. As a result of the 1996 amendments to the SDWA, source water protection has become a national priority. States are required to develop a plan for assessment of source waters for all federally defined public groundwater and surface water systems.

The Source Water Assessment Program (SWAP) involves determining the boundaries of the areas that are the source of waters for public water systems. For groundwater systems, these areas are defined using groundwater flow models. For surface water systems, the 14-digit Hydrologic Unit Code watershed is the designated protection area (although certain areas within the basin will be segmented as being of greater vulnerability to contamination from overland flow, groundwater contributions to surface water, and direct spills into the surface water). Known and potential sources of contamination in the delineated area must be identified, and the inventoried sources evaluated to determine the susceptibility of public water systems to such contaminants. Assessments must be made available to the public.

Local involvement will be a critical factor in the success of the SWAP, and local government, citizen groups, environmental groups, water suppliers, and the Department must all work together to increase the general public's awareness of where drinking water comes from and how to better protect sources of drinking water. Implementation of source water protection activities will occur at the local level, and local authorities may wish to base zoning and land-use planning on the source water assessments. The SWAP will be a key part of the Department's watershed management approach. To avoid duplication, information gathered from existing regulatory programs and/or watershed protection efforts will be utilized (e.g., ambient monitoring programs, TMDLs, etc.).

Consumer Confidence Reports

The Consumer Confidence Report (CCR) is an annual water quality report required of all Community water systems. The rationale behind the CCR is that consumers have a right to know what is in their drinking water and where it comes from. These reports are to educate consumers and help them make informed choices that affect the health of themselves and their families. It is believed that educated consumers are more likely to protect their drinking water sources. All CCRs are to include the following basic components:

- the water source, its location, and the availability of source water assessment plan;

- information about the water system (name and telephone number of a contact person, opportunities for public participation, and information for non-English speaking populations if applicable);
- definitions of terms and abbreviations used in the report;
- table of detected contaminants including the known or likely source of the contaminants;
- the health effects language for Maximum Contaminant Level violations and an explanation of the violation;
- information on cryptosporidium, radon, and other contaminants if applicable; and
- educational information that includes an explanation of contaminants and their presence in drinking water, an advisory for immuno-compromised people, the Safe Drinking Water Hotline telephone number, and other statements about lead, arsenic, and nitrate if applicable.

Nonpoint Source Education

The goal of the Nonpoint Source (NPS) Outreach Program is to educate the citizens of South Carolina about the sources of polluted runoff and techniques that can be used to reduce this runoff. The Program provides presentations on runoff pollution to community, church, civic, or professional groups; a variety of technical and non-technical publications on runoff pollution and reduction techniques; *Turning the Tide*, a free, quarterly Nonpoint Source newsletter; and teacher training that includes the *Action for a Cleaner Tomorrow* curriculum and information on reducing polluted runoff. To arrange a presentation, order publications, or ask questions, contact the NPS Education coordinator at 803-898-4300 or visit our website.

South Carolina Water Watch

South Carolina Water Watch is a unique effort to involve the public and local communities in water quality protection. The Water Watch program was developed to encourage South Carolina's citizens to become stewards of the State's lakes, rivers, streams, estuaries, and wetlands. Volunteers select a water resource on which to focus and perform activities aimed at protecting water quality, such as shoreline surveys, public education, and litter cleanups. The Water Watch coordinator assists participants with materials and training to help make projects successful. SCDHEC invites individuals, school groups, civic organizations, businesses, and local governments to learn about and protect the quality of our waterways by contacting the Water Watch coordinator at 803-898-4300 or visit our website.

Champions of the Environment

Champions of the Environment is a student recognition program that raises awareness of environmental issues. Nationally recognized for its innovative approach to environmental education, the program promotes hands-on learning by recognizing students working on exemplary environmental projects beyond the realm of the classroom. With scholarships and media coverage, Champions of the Environment encourages student initiative and self-esteem. The program promotes environmental awareness, leadership, conservation, creativity, and self-confidence through activities such as group projects, public speaking, and environmental research. Champions of the Environment is jointly sponsored by Dupont, International Paper, WIS-TV, and SCDHEC. For more information contact the Champions of the Environment coordinator at 803-898-4300 or visit our website.

Clean Water State Revolving Fund

Congress created the Clean Water State Revolving Fund (SRF) in 1987, to replace the §201 Construction Grants program. In doing so, 'state banks' were created to lend money for virtually any type of water pollution control infrastructure project. Project types include construction of wastewater treatment systems and NPS pollution control. The interest rate on the loans is always below the current market rate. As repayments are made on the loans, funds are recycled to fund additional water protection projects. The vast majority of the SRF funds have been used for the construction of traditional municipal wastewater treatment systems. Because of its inherent flexibility, the SRF program is well suited to accommodate the watershed approach. SRF loans are available to units of state, local, and regional government, and special purpose districts. South Carolina law prevents loans from being made directly to private organizations and individuals. Local governments such as cities and counties and other units of government such as Soil and Water Conservation Districts, Councils of Government, and Water and Sewer Districts are encouraged to apply for SRF loans for NPS projects. NPS projects may include construction and maintenance of stormwater management facilities, establishment of a stormwater utility, purchase of land for wetlands and riparian zones, and implementation of source water protection assessments. For more information, contact the SRF coordinator at 803-898-4300 or visit our website.

Drinking Water State Revolving Fund

The Drinking Water State Revolving Fund (DWSRF), sponsored by EPA under authority of the Safe Drinking Water Act, is a long-term debt financing program offered by the State of South Carolina to provide low-interest loans to communities for construction of drinking water facilities. Municipalities, counties, special purpose districts, and some non-profit corporations are eligible to apply. DWSRF projects, those complying with the Safe Drinking Water Act and providing for public health, may include upgrading of a surface water treatment system, adding new wells, interconnecting systems, and adding treatment or storage components. For more information, contact the State Revolving Fund coordinator at 803-898-4300 or visit our website.

Citizen-Based Watershed Stewardship Programs

Throughout the Savannah River Basin, water quality is a common interest among citizen groups. The issues and membership of these groups vary widely. Some of the citizen groups interested in water quality in the Savannah River Basin are described below.

Upstate Forever

Upstate Forever is a nonprofit, membership-based organization that promotes sensible growth, advocates for sustainable development practices, and protects special places in the Upstate region of South Carolina. It has three principal programs: Education, Advocacy, and Land Trust. For more information, see www.upstateforever.org.

Friends of Lake Keowee Society (FOLKS)

The mission of the Friends of Lake Keowee Society (FOLKS) is to preserve, protect, and enhance Lake Keowee and its watershed through conservation, science, and education. FOLKS conducts a Lake Sweep twice a year, monitors water clarity, regularly scouts for improper soil conservation practices, and conducts programs to monitor and detect water quality changes. With the assistance of a §319 grant from EPA, FOLKS is monitoring fecal coliform and sediment in streams and successfully implementing BMP's with cattle farmers, timber operators, and waterside communities.

Lake Hartwell Association

The Lake Hartwell Association (LHA) is a group of over 2000 members, primarily homeowners and recreational users of the lake, most of whom live in upstate South Carolina and northeast Georgia. The organization's purpose is to provide a focus on the lake and its watershed, maintain its high quality, and assist in guiding wholesome growth while retaining the area's desirable characteristics.

Savannah Riverkeeper, Inc.

The Savannah Riverkeeper, Inc. is a Savannah River basin water quality advocacy group whose primary purposes are to aid government agencies in identifying water quality problems, to educate the public about water quality issues, and to train volunteers to (1) recognize water quality impairments, (2) assess water quality biologically and chemically, (3) evaluate NPDES permits and compliance with those permits, (4) examine stormwater control issues, (5) identify specific sources of water impairments, and (6) propose actions to minimize threats to water quality.

Lake Secession/Rocky River Property Owners Association

The Lake Secession/Rocky River Property Owners Association is comprised of water users, property owners and interested parties on and near Rocky River in southern Anderson County and Lake Secession, which is primarily in Abbeville County. The association originated following a "spill" from a wastewater treatment facility and continues to keep water quality a high priority in its mission.

Aiken County Watershed Alliance

The Aiken County Watershed Alliance (ACWA) is a small group of concerned citizens, scientists, educators, and planners that have been meeting since fall of 2002 to determine ways to protect a unique Aiken County natural resource - the Upper Three Runs Watershed. The excellent water quality and habitat value of Cedar Creek and Upper Three Runs Creek, the two major tributaries that combine to form Upper Three Runs, create an ecological paradise. The waterways of the Upper Three Runs watershed harbor more species of aquatic insects than any other river, stream, or creek in the world. The watershed extends southeast from the City of Aiken, and is roughly delineated by S.C. Hwy. 19 to the southwest and U.S. Hwy. 78 to the northeast. Due to its south side location, the Upper Three Runs watershed is faced with the prospect of becoming one of Aiken County's most rapidly developing areas.

Tugaloo/Seneca River Basin Description

The ***Tugaloo River/Seneca River Basin*** encompasses 1,269 square miles that extends across the Blue Ridge and Piedmont regions of the State. The Tugaloo River/Seneca River Basin encompasses 13 watersheds and 811,957 acres, of which 71.7% is forested land, 16.3% is agricultural land, 6.5% is water, 4.5% is urban land, 0.6% is forested wetland, and 0.4% is barren land. The urban land percentage is comprised of numerous small towns and cities. There are approximately 1,441 stream miles and 58,392 acres of lake waters in this basin.

The Chattooga River flows across the North Carolina/South Carolina state line and flows between the states of South Carolina and Georgia. The Chattooga River then flows through Tugaloo Lake and Lake Yonah, becoming the Tugaloo River. The Tugaloo River accepts drainage from the Chauga River and other smaller streams before joining the Seneca River.

The Whitewater River and the Toxaway River join to form the Keowee River in Lake Jocassee near the North Carolina border. The Keowee River flows out of the Lake Jocassee Dam and into Lake Keowee. The Keowee River flows out of the Keowee Dam and merges with the Little River coming out of the Little River Dam to form the Seneca River and Lake Hartwell. The Seneca River within Lake Hartwell accepts drainage from Twelvemile Creek, Coneross Creek, Eighteenmile Creek and Three and Twenty Creek. The Tugaloo River converges with the Seneca River within Lake Hartwell to form the Savannah River.

Physiographic Regions

The State of South Carolina has been divided into six Major Land Resource Areas (MLRAs) by the USDA Soil Conservation Service. The MLRAs are physiographic regions that have soils, climate, water resources, and land uses in common. The physiographic region defining the Tugaloo River/Seneca River Basin is as follows:

The **Blue Ridge** is an area of dissected (separated by erosion into many closely spaced valley), rugged mountains with narrow valleys dominated by forests; elevations range from 1,000 to 3,300 feet.

The **Piedmont** is an area of gently rolling to hilly slopes with narrow stream valleys dominated by forests, farms, and orchards; elevations range from 375 to 1,000 feet.

Land Use/Land Cover

General land use/land cover mapping for South Carolina was derived from the U.S. Geological Survey's National Land Cover Data (NLCD), based on nationwide Landsat Thematic Mapper (TM) multispectral satellite images (furnished through the Multi-Resolution Land Characteristics (MRLC) consortium, coordinated by USEPA) using image analysis software to inventory the Nation's land classes. The NLCD are developed by the USGS (EROS Data Center) using TM image interpretation, air photo interpretation, National Wetland Inventory data analysis, and ancillary data analysis.

Urban land is characterized by man-made structures and artificial surfaces related to industrial, commercial, and residential uses, and vegetated portions of urban areas such as recreational grass lands and industrial facility lawns.

Agricultural/Grass land is characterized by row crops, pastures, orchards, vineyards, and hay land, and includes grass cover in fallow, scrub/shrub, forest clearcut and urban areas.

Forest land is characterized by deciduous and evergreen trees (or a mix of these), not including forests in wetland settings, generally greater than 6 meters (approximately 20 feet) in height, with tree canopy of 25-100% cover.

Forested Wetland is saturated bottomland, mostly hardwood, forests primarily composed of wooded swamps occupying river floodplains, moist marginal forests, and isolated low-lying wet areas, located predominantly in the Coastal Plain.

Nonforested Wetland is saturated marshland, most commonly located in coastal tidelands and in isolated freshwater inland areas, found predominantly in the Coastal Plain.

Barren land is characterized by a nonvegetated condition of the land, both natural (rock, beaches, nonvegetated flats) and man-induced (rock quarries, mines, and areas cleared for construction in urban areas or clearcut forest areas).

Water (non-land) includes both fresh (inland) and saline (tidal) waters.

Soil Types

The dominant soil associations, or those soil series comprising, together, over 40% of the land area, were recorded for each watershed in percent descending order. The individual soil series for the Tugaloo River and Seneca River Basin are described as follows.

Ashe soils are shallow to moderately deep, well drained to excessively drained soils in steep areas.

Cecil soils are deep, well drained, gently sloping to sloping soils that have red subsoil.

Hayesville soils are moderately shallow to deep, well drained soils in gently sloping to steep areas, with red to yellow-brown subsoil.

Hiwassee soils are well drained, moderately sloping soils with clayey subsoil, moderately deep.

Madison soils are well drained, moderately sloping soils, with clayey subsoil, moderately deep.

Pacolet soils are well drained, moderately steep soils with clayey subsoil, moderately deep.

Saluda soils are excessively drained to well drained, strongly sloping to very steep soils.

Slope and Erodibility

The definition of soil erodibility differs from that of soil erosion. Soil erosion may be more influenced by slope, rainstorm characteristics, cover, and land management than by soil properties. Soil erodibility refers to the properties of the soil itself, which cause it to erode more or less easily than others when all other factors are constant.

The soil erodibility factor, K, is the rate of soil loss per erosion index unit as measured on a unit plot, and represents an average value for a given soil reflecting the combined effects of all the soil properties that significantly influence the ease of soil erosion by rainfall and runoff if not protected. The

K values closer to 1.0 represent higher soil erodibility and a greater need for best management practices to minimize erosion and contain those sediments that do erode. The range of K-factor values in the Tugaloo River/Seneca River Basin is from 0.21 to 0.26.

Fish Consumption Advisory

At the time of publication, a fish consumption advisory issued by SCDHEC is in effect for Lake Jocassee, Lake Tugaloo, Lake Yonah, Lake Hartwell, the Seneca River arm of Lake Hartwell, and Twelvemile Creek advising people to limit the amount of some types of fish consumed from these waters. Fish consumption advisories are updated annually in March. For background information and the most current advisories please visit the Bureau of Water homepage at http://www.scdhec.gov/water and click on "Advisories". For more information or a hard copy of the advisories, call SCDHEC's Division of Health Hazard Evaluation toll-free at (888) 849-7241.

Climate

Normal yearly rainfall in the Tugaloo River/Seneca River area during the period of 1971 to 2000 was 60.31 inches, according to South Carolina's 30-year climatological record. Data compiled from National Weather Service stations in Longcreek, Salem, Walhalla, Clemson University, Pickens, Jocassee, Anderson, and Anderson County Airport were used to determine the general climate information for the northwestern corner of the state. The highest seasonal rainfall occurred in the winter with 16.17 inches; 15.53, 14.66, and 13.95 inches of rain fell in the spring, summer, and fall, respectively. The average annual daily temperature was 59.2 ^{o}F, the coolest in the state. Winter temperatures averaged 41.9^{o}F, spring temperatures averaged 58.7 ^{o}F and summer and fall mean temperatures were 75.9 ^{o}F and 60.2 ^{o}F, respectively.

Watershed Evaluations

03060102-010

(Chattooga River)

General Description

Watershed 03060102-010 is located in Oconee County and consists primarily of the ***Chattooga River*** and its tributaries from where it crosses the North Carolina border to its confluence with the Tallulah River on the Georgia side at the Tugaloo Dam. The watershed occupies 34,825 acres of the Blue Ridge region of South Carolina. The predominant soil types consist of an association of the Hayesville - Saluda-Ashe series. The erodibility of the soil (K) averages 0.21, and the slope of the terrain averages 39% with a range of 10-80%. Land use/land cover in the watershed includes: 93.7% forested land, 5.4% agricultural land, 0.2% barren land, 0.6% water, and 0.1% forested wetland.

The Chattooga River flows across the North Carolina/South Carolina border in the northwest corner of South Carolina, flowing between the states of South Carolina and Georgia. Streams flowing into the river from the Georgia side are connoted with an asterisk. Flowing out of North Carolina, the river accepts drainage from Bad Creek, East Fork Chattooga River (Dark Branch, Jacks Creek, Indian Camp Branch), Harden Creek*, King Creek, Lick Log Creek (Thrift Lake, Pigpen Branch), Ira Branch, and Reed Creek*, West Fork*, Holden Branch*, Adline Branch*, Bynum Branch*, and Laurel Branch*. Further downstream, Moss Mill Creek enters the river followed by Warwomen Creek*, Dicks Creek*, Whetstone Creek (Tyler Branch, Swaford Branch, Harts Branch), Rock Creek*, Buckeye Branch*, Lick Long Creek*, and Turpin Branch. Fall Creek (Fall Creek, North Fork Fall Creek, Stump Branch) enters the river next followed by Tilly Branch, Pole Creek*, Reedy Branch, Stekoa Creek*, Cliff Creek*, Long Creek, Pinckney Branch, Daniel Creek*, Fishtrap Branch, Camp Creek*, and Opossum Creek (Camp Branch, Sawhead Branch, Shoulder Bone Branch). The Chattooga River then flows through Lake Tugaloo accepting drainage from Devils Branch, Bad Creek*, and Worse Creek* before merging with the Tallulah River* to form the Tugaloo River. There are a total of 96.5 stream miles and 161.2 acres of lake waters within the South Carolina portion of the watershed.

The Chattooga River and its tributaries from the North Carolina line to Opossum Creek are classified ORW with the following exceptions. The portion of East Fork Chattooga River from its confluence with Indian Camp Branch to the Chattooga River is classified TN, Whetstone Creek and Swaford Branch are classified TN, and Turpin Branch, Fall Creek, Tilly Branch, Reedy Branch, Long Creek, Pinckney Branch, Fishtrap Branch, and Opossum Creek are classified FW. The Chattooga River and its tributaries from Opossum Creek to the Tugaloo River are classified FW. Lake Tugaloo is classified TPGT. The Sumter National Forest extends across the entire watershed.

Surface Water Quality

Station #	Type	Class	Description

SV-308	S/BIO	ORW	EAST FORK CHATTOOGA RIVER AT SC 107, 2 MI S OF STATE LINE
SV-792	BIO	ORW	EAST FORK CHATTOOGA RIVER 300 MI DOWNSTREAM OF HATCHERY OUTFALL
SV-227	P/BIO	ORW	CHATTOOGA RIVER AT SC 28 3.5 MI NW MT REST
SV-199	P	ORW	CHATTOOGA RIVER AT US 76
SV-359	W	FW	LAKE TUGALOO , FOREBAY EQIDISTANT FROM SPILLWAY AND SHORELINE

Chattooga River – There are two monitoring stations along the Chattooga River. Aquatic life uses are fully supported at the upstream site **(SV-227)**. Significant decreasing trends in five-day biochemical oxygen demand, turbidity, and total nitrogen concentration suggest improving conditions for these parameters. Recreational uses are fully supported; however, there is a significant increasing trend in fecal coliform bacteria concentration.

Aquatic life uses are also fully supported at the downstream site **(SV-199)**; however, there is a significant increasing trend in total phosphorus concentration. A significant decreasing trend in turbidity suggests improving conditions for this parameter. PCB 1232 was detected in the 1997 sediment sample. Recreational uses are fully supported and a significant decreasing trend in fecal coliform bacteria concentration suggests improving conditions for this parameter.

East Fork Chattooga River - There are two monitoring sites along the East Fork Chattooga River. At the upstream site ***(SV-308),*** aquatic life uses are fully supported based on macroinvertebrate community, physical, and chemical data. There is a significant increasing trend in pH. A significant decreasing trend in five-day biochemical oxygen demand suggests improving conditions for this parameter. Recreational uses are fully supported at this site. At the downstream site ***(SV-792),*** aquatic life uses are fully supported based on macroinvertebrate community data.

Lake Tugaloo (SV-359) - Aquatic life and recreational uses are fully supported.

A fish consumption advisory has been issued by the Department for mercury and includes Lake Tugaloo within this watershed (see advisory p. 37).

NPDES Program

Active NPDES Facilities

RECEIVING STREAM FACILITY NAME PERMITTED FLOW @ PIPE (MGD)	***NPDES# TYPE COMMENT***
EAST FORK CHATTOOGA RIVER SCDNR/WALHALLA FISH HATCHERY PIPE #: 002 FLOW: M/R	SC0000451 MINOR INDUSTRIAL

Growth Potential

There is a low potential for growth in this watershed, which resides entirely within the Sumter National Forest. The steep slopes of this region would limit establishment of infrastructure and any serious growth

03060102-060

(Tugaloo River)

General Description

Watershed 03060102-060 is located in Oconee County and consists primarily of the ***Tugaloo River*** and its tributaries from its origin to the Chauga River. The watershed occupies 26,992 acres of the Blue Ridge region of South Carolina. The predominant soil types consist of an association of the Hayesville-Saluda-Pacolet series. The erodibility of the soil (K) averages 0.22, and the slope of the terrain averages 27.7%, with a range of 10-80%. Land use/land cover in the watershed includes: 91.7% forested land, 0.1% forested wetland, 0.2% nonforested wetland, 3.4% agricultural land, 0.1% urban land, 1.2% barren land, and 3.3% water.

The Tugaloo River is formed by the confluence of the Tallulah River in Georgia and the Chattooga River. Streams flowing into the river from the Georgia side are connoted with an asterisk. Downstream of the confluence, the Tugaloo River accepts drainage from Battle Creek (Daniel Branch) and Moccasin Creek* before flowing through Lake Yonah. Downstream of Yonah Dam, the Tugaloo River accepts drainage from Panther Creek*, Brasstown Creek (Devil Hole Branch, Wallace Branch, Big Branch, Double Branch, Little Brasstown Creek, Joe Branch, Porter Branch, Boatwright Creek, Mill Branch), Rothwell Creek*, Cherry Cove Branch, and Rocky Branch*. The Tugaloo River begins to impound as an arm of Lake Hartwell and accepts drainage from Prather Creek*, Barton Creek (Drummond Creek), Longnose Creek (East Longnose Creek), Gryer Branch, Ramsey Pond, and Ward Creek*. There are a total of 56.2 stream miles and 992.2 acres of lake waters within the South Carolina portion of the watershed, all classified FW except for Battle Creek and Brasstown Creek, which are classified TPGT. The upper portion of the watershed resides in the Sumter National Forest.

Surface Water Quality

Station #	Type	Class	Description
SV-358	W	FW	LAKE YONAH, ½ WAY BETW. CENTER OF SPILLWAY AND OPPOSITE SHORE
SV-673	BIO	FW	BRASSTOWN CREEK AT S-37-48
SV-200	S	FW	TUGALOO RIVER ARM OF LAKE HARTWELL AT US 123

Tugaloo River Arm (SV-200) **-** Aquatic life uses are fully supported. There is a significant increasing trend in pH. A significant decreasing trend in five-day biochemical oxygen demand suggests improving conditions for this parameter. Recreational uses are fully supported.

Lake Yonah (SV-358) – Aquatic life uses are not supported due to total phosphorus excursions. Recreational uses are fully supported.

Brasstown Creek (SV-673) **-** Aquatic life uses are fully supported based on macroinvertebrate community data.

A fish consumption advisory has been issued by the Department for mercury and includes Lake Yonah within this watershed (see advisory p. 37).

Growth Potential

There is a low potential for growth in this watershed. A substantial portion of the watershed resides within the Sumter National Forest and the steep slopes of this region would limit establishment of infrastructure and any serious growth.

03060102-120

(Chauga River)

General Description

Watershed 03060102-120 is located in Oconee County and consists primarily of the ***Chauga River*** and its tributaries. The watershed occupies 70,768 acres of the Blue Ridge region of South Carolina. The predominant soil types consist of an association of the Pacolet-Hayesville-Madison series. The erodibility of the soil (K) averages 0.23, and the slope of the terrain averages 22.3%, with a range of 6-80%. Land use/land cover in the watershed includes: 93.9% forested land, 4.9% agricultural land, 0.4% water, 0.1% forested wetland, 0.4% urban land, and 0.3% barren land.

Village Creek (West Village Creek, Mountain Rest Lake) and East Village Creek (Clear Branch, Big Stakey Creek, Ores Mill Creek, Chattooga Lake, Taylor Creek) join to form the Chauga River. The river accepts drainage from Jerry Creek (Crystal Lake, Lake Becky, Oconee State Park Lake), Miller Field Branch, Coppermine Branch, Limestone Creek (Grapevine Branch), Bone Camp Creek (Sawyer Branch, Orchard Branch, Chambers Branch), Hell Hole Creek (Long Branch), and Shingle Mill Branch. Further downstream, the Chauga River accepts drainage from Hickory Flat Branch, Rhoda Branch, Mill Creek (Woodall Branch), Double Branch, Spider Valley Creek (Persimmon Branch, Laurel Creek, Sand Creek), Doran Creek, and Crooked Creek. Cedar Creek (Baker Branch) enters the river next, followed by Spy Rock Creek, Devils Fork Creek (Flint Creek), Barton Creek, Muddy Creek (Findley Branch), and Rocky Fork. The Chauga River and its tributaries from its origin to 1 mile above U.S. 76 are classified ORW, with the exception of Jerry Creek (FW).

The Chauga River then accepts drainage from Ramsey Creek (Collins Lake) and Dickson Lake. West Toxaway Creek and East Toxaway Creek join to form Toxaway Creek (Big Branch, Little Longnose Creek, Sourwood Branch, Little Toxaway Creek, Harper Pond), which flows into the Chauga River near the base of the watershed to form an arm of Lake Hartwell. The Chauga River and its tributaries from 1 mile above U.S. 76 to its confluence with the Tugaloo River are classified FW. There are a total of 177.4 stream miles and 506.1 acres of lake waters in this watershed. The upper two thirds of the watershed resides within the Sumter National Forest.

Surface Water Quality

Station #	Type	Class	Description
SV-675	BIO	ORW	CHAUGA RIVER AT S-37-193
SV-344	W	FW	CHAUGA RIVER AT S-37-34
SV-225	BIO	FW	TOXAWAY CREEK AT S-37-34

Chauga River - There are two monitoring sites along the Chauga River. At the upstream site ***(SV-675),*** aquatic life uses are fully supported based on macroinvertebrate community data. At the downstream site ***(SV-344)***, aquatic life uses are also fully supported. Recreational uses are partially supported at this site due to fecal coliform bacteria excursions.

Toxaway Creek (SV-225) - Aquatic life uses are fully supported based on macroinvertebrate community data.

Natural Swimming Areas

FACILITY NAME ***RECEIVING STREAM***	***PERMIT #*** ***STATUS***
CAMP CHATUGA ORES MILL CREEK	37-N04 ACTIVE
OCONEE STATE PARK JERRY CREEK	37-N02 ACTIVE

NPDES Program

Active NPDES Facilities

RECEIVING STREAM ***FACILITY NAME*** ***PERMITTED FLOW @ PIPE (MGD)***	***NPDES#*** ***TYPE*** ***COMMENT***
JERRY CREEK SCPRT/OCONEE STATE PARK PIPE #: 001 FLOW: 0.06	SC0024872 MINOR DOMESTIC

Water Supply

WATER USER (INTAKE #) ***STREAM***	***TOTAL PUMP. CAPACITY (MGD)*** ***RATED PUMP. CAPACITY (MGD))***
TOWN OF WESTMINSTER (S37103) RAMSEY CREEK	3.8 1.8
TOWN OF WESTMINSTER (S37104) CHAUGA RIVER	8.0 4.0

Growth Potential

There is a low potential for growth in this watershed, which has a large area residing within the Sumter National Forest. The steep slopes of this region would limit establishment of infrastructure and any serious growth.

03060102-130

(Tugaloo River/Lake Hartwell)

General Description

Watershed 03060102-130 is located in Oconee and Anderson Counties and consists primarily of the ***Tugaloo River*** and its tributaries as it flows through ***Lake Hartwell***. The watershed occupies 84,966 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Cecil-Hiwassee-Madison series. The erodibility of the soil (K) averages 0.25, and the slope of the terrain averages 11.5%, with a range of 2-25%. Land use/land cover in the watershed includes: 55.3% forested land, 31.7% agricultural land, 9.8% water, 0.7% forested wetland, 2.3% urban land, 0.1% nonforested wetland, and 0.1% barren land.

This portion of the Tugaloo River flows through Lake Hartwell and between the states of South Carolina and Georgia. Streams flowing into the river from the Georgia side are connoted with an asterisk. The Tugaloo River accepts drainage from Rock Creek*, Eastanolla Creek*, Choestoea Creek (Johns Pond, Freeman Pond, Norris Creek, Harbin Creek, Little Choestoea Creek), Crawford Creek*, Little Crawford Creek*, Whitworth Creek*, Shoal Creek*, Fairplay Creek, Paynes Creek*, Reed Creek*, Beaverdam Creek (Mud Creek, Cleveland Creek), Cranes Creek*, and Little Beaverdam Creek before merging with the Seneca River Watershed to form the Savannah River. There are a total of 126.2 stream miles and 9,756.6 acres of lake waters in this watershed, all classified FW.

Surface Water Quality

Station #	Type	Class	Description
SV-301	S	FW	NORRIS CREEK AT S-37-435, 1 MI S OF WESTMINSTER
SV-108	W/BIO	FW	CHOESTOEA CREEK AT S-37-49
SV-345	W/BIO	FW	BEAVERDAM CREEK AT S-37-66

Norris Creek (SV-301) - Aquatic life uses are fully supported. A significant increasing trend in dissolved oxygen concentration and significant decreasing trend in turbidity suggest improving conditions for these parameters. Recreational uses are not supported due to fecal coliform bacteria excursions. In addition, there is a significant increasing trend in fecal coliform bacteria concentration.

Choestoea Creek (SV-108) - Aquatic life uses are fully supported based on macroinvertebrate community, physical, and chemical data. Recreational uses are not supported due to fecal coliform bacteria excursions.

Beaverdam Creek (SV-345) – Aquatic life uses are fully supported based on macroinvertebrate community, physical, and chemical data. Recreational uses are not supported due to fecal coliform bacteria excursions. A total maximum daily load (TMDL) has been developed for SV-345 to address this impairment (see Watershed Protection and Restoration Strategies below).
A fish consumption advisory has been issued by the Department for PCBs (Polychlorinated biphenols) and includes Lake Hartwell within this watershed. A fish consumption advisory has also been issued by

the State of Georgia for mercury and PCBs for the Tugaloo River arm of Lake Hartwell within this watershed (see advisory p. 37).

NPDES Program

Active NPDES Facilities

RECEIVING STREAM ***FACILITY NAME*** ***PERMITTED FLOW @ PIPE (MGD)***	***NPDES#*** ***TYPE*** ***COMMENT***
CHOESTOEA CREEK TOWN OF WESTMINSTER WTP PIPE #: 001 FLOW: M/R	SCG645032 MINOR INDUSTRIAL
LITTLE CHOESTOEA CREEK OAKWAY ELEM. & MIDDLE SCHOOLS PIPE #: 001 FLOW: 0.015	SC0033944 MINOR DOMESTIC
HARBIN CREEK WEST OAK HS/OCONEE CO. SCH. DIST. PIPE #: 001 FLOW: 0.032	SC0038644 MINOR DOMESTIC
LAKE HARTWELL TOTAL ENVIRON/FOXWOOD HILLS SD PIPE #: 001 FLOW: 0.10 PIPE #: 001 FLOW: 0.20 (PROPOSED TIER) PIPE #: 001 FLOW: 0.40 (PROPOSED TIER) PIPE #: 001 FLOW: 0.80 (PROPOSED TIER) PIPE #: 001 FLOW: 1.40 (PROPOSED TIER)	SC0022357 MINOR DOMESTIC
LAKE HARTWELL SCDOT WELCOME CENTER/FAIRPLAY PIPE #: 001 FLOW: 0.015	SC0026638 MINOR DOMESTIC
LAKE HARTWELL NACO/CAROLINA LANDING CAMPGROUND PIPE #: 001 FLOW: 0.04	SC0022063 MINOR DOMESTIC

Nonpoint Source Management Program

Land Disposal Activities

Landfill Facilities

LANDFILL NAME ***FACILITY TYPE***	***PERMIT #*** ***STATUS***
STONE BRIDGE CORP. C&D	372900-1301 INACTIVE

Land Application Sites

LAND APPLICATION SYSTEM ***FACILITY NAME***	***ND#*** ***TYPE***
SPRAYFIELD	ND0065927

CHICKASAW UTIL./CHICKASAW POINT	DOMESTIC
SPRAYFIELD	ND0067237
LAKESIDE INN	DOMESTIC

Growth Potential

There is a moderate potential for growth in this watershed, which contains portions of the Town of Westminster and Lake Hartwell. Particular emphasis will be placed on residential, commercial, and industrial growth and development along the U.S. Hwy 123 corridor, beginning with Westminster and extending towards the City of Seneca. I-85 crosses the lower portion of the watershed, and development pressures continue along the lakeshore.

Watershed Protection and Restoration Strategies

Total Maximum Daily Loads (TMDLs)

A TMDL was developed for Beaverdam Creek to determine the maximum amount of fecal coliform bacteria it can receive from nonpoint sources and still meet water quality standards. Agriculture and Silviculture are the two major land uses in the watershed and both can be sources of fecal coliform. Targeting agricultural land for reduction of bacteria is the most effective strategy for this watershed. The TMDL translates to an agricultural reduction of 55%. Forested lands are not targeted for reduction, as there are currently no acceptable means of reducing fecal coliform sources within that land use.

A TMDL implementation project with Clemson Extension as the lead organization has been funded through USEPA under a §319 grant through SCDHEC. This project will be working with local farmers and homeowners to cost share with the installation of Best Management Practices (BMPs) to reduce the fecal coliform bacteria loading. Some of the partners on the project include Natural Resources Conservation Service (NRCS) and Oconee County Soil and Water Conservation District. The project is scheduled to be completed by December 2004.

Special Projects

TMDL Implementation Underway in Coneross Creek/ Beaverdam Creek Watersheds

Funded through a §319 grant from EPA, a new effort to combat bacterial pollution in two adjacent watersheds in Oconee County began in December 2002. Acting as lead organization, the Clemson Cooperative Extension Service (CES) has initiated a two-year project that promises to implement bacteria runoff control measures in critical areas throughout the watersheds.

Reductions in fecal coliform bacteria were called for in the Coneross Creek and Beaverdam Creek Total Maximum Daily Load (TMDL) developed by SCDHEC in 1999 and 2000, respectively. If successful, this implementation project will result in improved water quality and consistent attainment of water quality standards for fecal coliform bacteria (FC). Two SCDHEC monitoring stations in the Beaverdam Creek watershed showed that state standards for FC were chronically exceeded and that the load would need to be reduced by over 50% to meet the standard. An approximate 50% reduction is also needed in the Coneross Creek watershed to meet FC standards there.

To correct this problem, the project sponsor will implement a combination of BMPs on a watershed scale that include detailed waste and grazing management procedures, engineered BMPs focusing on riparian zones, septic system upgrades including constructed wetlands, and an extensive educational campaign targeted towards homeowners. Clemson CES has recruited a number of partners in this effort including the USDA Natural Resources Conservation Service, Oconee Co. Soil and Water Conservation District, Oconee Co. Beef Cattlemen's Association and the DHEC Oconee Co. Health Dept. The Beaverdam Creek/Coneross Creek TMDL Project, using the diverse expertise available in this partnership, should result in improvement to water quality in these watersheds.

03060101-010

(Keowee River/Lake Jocassee)

General Description

Watershed 03060101-010 is located in Oconee and Pickens Counties and consists primarily of the ***Keowee River*** and its tributaries, flowing through and forming ***Lake Jocassee***. The watershed occupies 31,823 acres of the Blue Ridge region of South Carolina. The predominant soil types consist of an association of the Ashe-Saluda series. The erodibility of the soil (K) averages 0.23, and the slope of the terrain averages 45%, with a range of 10-65%. Land use/land cover in the watershed includes: 74.1% forested land, 23.9% water, 0.8% forested wetland, 0.7% barren land, 0.5% agricultural land, and 0.1% nonforested wetland.

The Keowee River is formed by the confluence of the Whitewater River and the Toxaway River, both originating in North Carolina. The Whitewater River flows across the North Carolina/South Carolina Stateline and accepts drainage from the Thompson River (Coley Creek, Wright Creek) and Devils Fork. Corbin Creek and Howard Creek (Bad Creek, Bad Creek Reservoir, Limber Pole Creek) join to form Devils Fork, which accepts drainage from another Bad Creek before joining the Whitewater River within Lake Jocassee. The Toxaway River flows across the Stateline and accepts drainage from the Horsepasture River (Mill Creek), Laurel Fork Creek (Long Branch, Bad Creek, Jackies Branch), and Devils Hole Creek before joining the Whitewater River to form the Keowee River. In the northeastern portion of the watershed, Rock Creek flows out of and back into North Carolina.

Lake Jocassee is classified TGPT, along with Coley Creek, Mill Creek, and a Bad Creek. Jackies Branch, Rock Creek, and Limber Pole Creek are classified TN. Laurel Fork Creek and its tributaries are classified TN from its origin to Lake Jocassee, and Thompson Creek is classified TN from the Stateline to Lake Jocassee. Wright Creek is classified ORW from its origin to Lake Jocassee, and the Whitewater River is classified ORW from the Stateline to Lake Jocassee. Howard Creek is classified ORW from its origin to Bad Creek, and from Bad Creek to Devils Fork it is classified TN. Corbin Creek is classified ORW from its origin to its confluence with Howard Creek. Devils Fork is classified TN from its origin to Lake Jocassee. Bad Creek Reservoir is classified FW. There are a total of 36.7 stream miles and 7,643.8 acres of lake waters in this watershed. The majority of the watershed resides within the Sumter National Forest.

Surface Water Quality

Station #	Type	Class	Description
SV-335	P	TPGT	L. Jocassee at Toxaway R., Horse Pasture R. & Laurel FK CK Confl.
SV-334	P	TPGT	Lake Jocassee, main body
SV-337	P	TPGT	Lake Jocassee outside Coffer dam at Bad Creek Project
SV-336	P	TPGT	Lake Jocassee at Thompson River & Whitewater River Confluence..

Lake Jocassee – There are four monitoring sites along Lake Jocassee. Recreational uses are fully supported **at all sites,** and significant decreasing trends in fecal coliform bacteria concentration suggest improving conditions for this parameter for the lake.

Aquatic life uses are fully supported at the furthest uplake site ***(SV-335)***; however, there is a significant decreasing trend in dissolved oxygen concentration and significant increasing trends in pH and total phosphorus concentration. A significant decreasing trend in five-day biochemical oxygen demand suggests improving conditions for this parameter. Aquatic life uses are also fully supported further downlake ***(SV-334)***; however, there are significant increasing trends in pH and total phosphorus. Significant decreasing trends in five-day biochemical oxygen demand, turbidity, and total nitrogen concentration suggest improving conditions for these parameters.

Aquatic life uses are fully supported at site ***SV-337***, and significant decreasing trends in five-day biochemical oxygen demand and turbidity suggest improving conditions for these parameters. There is a significant increasing trend in pH. Aquatic life uses are also fully supported at ***SV-336***; however, there is a significant decreasing trend in dissolved oxygen concentration and significant increasing trends in pH and total phosphorus concentration. Significant decreasing trends in five-day biochemical oxygen demand and turbidity suggest improving conditions for these parameters.

A fish consumption advisory has been issued by the Department for mercury and includes Lake Jocassee within this watershed (see advisory p. 37).

Natural Swimming Areas

FACILITY NAME ***RECEIVING STREAM***	***PERMIT #*** ***STATUS***
DEVILS FORK STATE PARK LAKE JOCASSEE	37-N13 ACTIVE

Nonpoint Source Management Program

Land Disposal Activities

Landfill Facilities

LANDFILL NAME ***FACILITY TYPE***	***PERMIT #*** ***STATUS***
DUKE POWER-BAD CREEK INDUSTRIAL	373303-1602 (IWP-193) ---------

Growth Potential

Residential growth in and adjacent to the mountain region is predicted at relatively high levels, despite the low population base. The Nantahala National Forest extends across the top of the watershed, and the Sumter National Forest extends across the majority of the remaining watershed and would tend to limit growth in those areas.

03060101-030

(Keowee River/Lake Keowee)

General Description

Watershed 03060101-030 is located in Oconee and Pickens Counties and consists primarily of the ***Keowee River*** and its tributaries from the Jocassee Dam to the Keowee Dam forming ***Lake Keowee***. The watershed occupies 78,800 acres of the Blue Ridge and Piedmont regions of South Carolina. The predominant soil types consist of an association of the Pacolet-Ashe-Hayesville series. The erodibility of the soil (K) averages 0.23, and the slope of the terrain averages 28%, with a range of 2-80%. Land use/land cover in the watershed includes: 87.3% forested land, 8.7% water, 3.1% agricultural land, 0.4% forested wetland, 0.3% urban land, and 0.2% barren land.

The Keowee River flows out of the Jocassee Dam and into Lake Keowee. Cane Creek (Bully Branch, Dammo Branch), McKinneys Creek, and Eastatoe Creek all form arms of the lake. Eastatoe Creek flows over the Stateline and accepts drainage from Wild Hog Creek, Abner Creek (Dogwood Creek), Rocky Bottom Creek, Side-of-Mountain Creek, Laurel Branch, Laurel Creek, Reedy Cove Creek, Smith Creek, Jewell Branch, Mill Creek (Kinney Branch, Chucky Branch), Barn Branch, Peach Orchard Branch, Little Eastatoe Creek, and Poe Creek before flowing into the Keowee River. Little Eastatoe Creek accepts drainage from Winnie Branch, Mine Times Creek, and Clearwater Branch before joining Eastatoe Creek. Downstream from the Eastatoe Creek confluence, the river accepts drainage from Boones Creek, Cedar Creek (Lake Diana, Little Cedar Creek), and Fall Creek. Crow Creek (Lake Carlton, Katoma Branch, East Fork, Ellenburg Branch, Taylor Branch, Little Crow Creek) enters the lake next, followed by Betty Branch, Caney Branch, Mile Creek, Whetner Branch, and Kelly Creek.

There are a total of 133.0 stream miles and 7,887.0 acres of lake waters in this watershed. Lake Keowee and its tributaries are classified FW with the following exceptions. Cane Creek and its tributaries from its origin to Lake Keowee are classified TN. Eastatoe Creek and tributaries are classified ORW from the Stateline to Laurel Creek, and TPGT from Laurel Creek to Lake Keowee. Reedy Cove Creek is classified FW.

Surface Water Quality

Station #	Type	Class	Description
SV-741	BIO	ORW	Eastatoe Creek at S-39-237
SV-676	BIO	ORW	Rocky Bottom Creek at US 178
SV-230	P/BIO	TPGT	Eastatoe Creek at S-39-143
SV-341	W/BIO	TPGT	Little Eastatoe Creek at S-39-49
SV-338	P	FW	Lake Keowee above SC 130 and dam

Eastatoe Creek – There are two monitoring sites along Eastatoe Creek. At the upstream site ***(SV-741),*** aquatic life uses are fully supported based on macroinvertebrate community data. At the downstream site ***(SV-230),*** aquatic life uses are fully supported based on macroinvertebrate community, physical, and chemical data. There is a significant increasing trend in pH. A significant increasing trend in dissolved oxygen and significant decreasing trends in five-day biochemical oxygen demand, turbidity, total nitrogen, and total suspended solids concentrations suggest improving conditions for these parameters. Recreational uses are fully supported.

Rocky Bottom Creek (SV-676) - Aquatic life uses are fully supported based on macroinvertebrate community data.

Little Eastatoe Creek (SV-341) - Aquatic life uses are fully supported based on macroinvertebrate community, physical, and chemical data. Recreational uses are partially supported due to fecal coliform bacteria excursions. A total maximum daily load (TMDL) has been developed for SV-341 to address this impairment (see Watershed Protection and Restoration Strategies below).

Lake Keowee (SV-338) - Aquatic life uses are fully supported. There is a significant increasing trend in pH. Significant decreasing trends in five-day biochemical oxygen demand, turbidity, and total nitrogen concentrations suggest improving conditions for these parameters. Recreational uses are fully supported and a significant decreasing trend in fecal coliform bacteria concentration suggests improving conditions for this parameter.

Natural Swimming Areas

FACILITY NAME ***RECEIVING STREAM***	***PERMIT #*** ***STATUS***
MCCALL ROYAL AMBASSADOR CAMP REEDY COVE CREEK	39-N03 ACTIVE

NPDES Program

Active NPDES Facilities

RECEIVING STREAM ***FACILITY NAME*** ***PERMITTED FLOW @ PIPE (MGD)***	***NPDES#*** ***TYPE*** ***COMMENT***
REEDY COVE CREEK MCCALL ROYAL AMBASSADOR CAMP PIPE #: 001 FLOW: 0.012	SC0026557 MINOR DOMESTIC
LAKE KEOWEE DUKE POWER/OCONEE NUCLEAR PIPE #:001 FLOW: 2,442.9	SC0000515 MAJOR INDUSTRIAL

Nonpoint Source Management Program

Land Disposal Activities

Landfill Facilities

LANDFILL NAME ***FACILITY TYPE***	***PERMIT #*** ***STATUS***
McMILLAN-CARTER INC. C&D	392900-1301 INACTIVE

NIMMONS BRIDGE ROAD	372690-1701
C&D, YT	ACTIVE

Water Quantity

WATER USER	***TOTAL PUMP. CAPACITY (MGD)***
STREAM	***RATED PUMP. CAPACITY (MGD)***
GREENVILLE WATER SYSTEM	45.0
LAKE KEOWEE	30.0

Plant expansion is underway to increase capacity.

Growth Potential

There is a moderate to high potential for growth in this watershed, which contains Lake Keowee. Residential growth in and adjacent to the mountain region is predicted at relatively high levels, despite the low population base.

Watershed Protection and Restoration Strategies

Total Maximum Daily Loads (TMDLs)

Levels of fecal coliform bacteria can be elevated in water bodies as the result of both point and nonpoint sources of pollution. Little Eastatoe Creek (class freshwater, FW) is currently in violation of the fecal coliform bacteria water quality standard, as more than 10% of the samples collected at SV-341 during 1992-1996 exceed the 400 colonies/100ml standard. Agriculture and forest are two major land uses in the Little Eastatoe Creek watershed. Both can be sources of fecal coliform bacteria. Targeting agricultural land for reduction of bacteria is the most effective strategy for this watershed. The geometric mean for this site is 213.9 colonies/100ml.

Using a target level of bacteria of 175 colonies/100ml, the target loading for Little Eastatoe Creek is 9.40 x 1010 colonies/day. This translates to an agricultural reduction of 21% or a final agricultural loading of 7.82 x 1010 colonies/day. Forested lands are not targeted for reduction, as there are currently no acceptable means of reducing fecal coliform sources within that land use. There are several tools available for implementing this TMDL, including an ongoing §319 funded project, as well as other NPS pollution outreach materials. SCDHEC will continue to monitor water quality in Little Eastatoe Creek to evaluate the effectiveness of these measures.

Special Projects

Formation of the Oconee-Pickens Clean Water Action (OPCWA) by the Friends Of Lake Keowee Society (FOLKS) – Midpoint Project Report

A §319 grant from EPA was awarded to Friends Of Lake Keowee Society (FOLKS) in July 1999. The grant enabled the formation of Oconee-Pickens Clean Water Action (OPCWA), a partnership of conservation interests that includes Clemson University, S.C. Forestry Commission, USDA/NRCS, county governments, Duke Energy, and citizens of Oconee and Pickens Counties. FOLKS serves as the lead organization, providing project management, volunteer support, and partial funding.

The objective of OPCWA is to improve impaired waterways in the Lake Keowee watershed, by reducing nonpoint sources of fecal coliform and metals. Education and public awareness regarding nonpoint sources were also targeted. At project start, the designated impairments included fecal coliform in Cane Creek, Little Cane Creek, and Little Eastatoe Creek; and metals in Big Eastatoe Creek and parts of Lake Keowee.

The strategy for improvement was to first locate and prioritize pollution "hot spots" through rounds of water testing and land use survey; and then to bring best management practices (BMPs) to remediate the associated pollution sources. This is being done through a combination of educational outreach and cost sharing for BMP implementation. Pollution sources identified and targeted in the impaired areas included mine and marine wastes, unbuffered timber and livestock operations, waterside landscapes, and waterside communities on septic systems.

03060101-040

(Seneca River/Lake Hartwell)

General Description

Watershed 03060101-040 is located in Oconee, Pickens, and Anderson Counties and consists primarily of the ***Seneca River arm of Lake Hartwell***. The watershed occupies 114,780 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Cecil-Hiwassee series. The erodibility of the soil (K) averages 0.26, and the slope of the terrain averages 11%, with a range of 2-25%. Land use/land cover in the watershed includes: 56.8% forested land, 18.8% agricultural land, 13.7% water, 9.5% urban land, 1.0% forested wetland, 0.1% nonforested wetland, and 0.1% barren land.

The Keowee River flows out of the Keowee Dam and accepts drainage from Fourmile Creek, the Little River (flowing out of the Little River Dam), and Sixmile Creek (Wildcat Creek, Lake Issaqueena) before merging with the Twelvemile Creek watershed to form the Seneca River. Downstream of the confluence, the Seneca River accepts drainage from Seneca Creek, Shiloh Branch, Martin Creek, the Coneross Creek watershed, Camp Creek, the Eighteenmile Creek watershed, and Six and Twenty Creek. Six and Twenty Creek accepts drainage from Jones Creek, Town Creek, Hembree Creek, Hurricane Creek, Steel Creek, Salem Creek, Prichards Branch before merging with the Three and Twenty Creek watershed to form Deep Creek, which drains into the Seneca River. At the base of the watershed, the Seneca River joins with the Tugaloo River watershed to form the Savannah River watershed. There are a total of 138.0 stream miles and 16,628.2 acres of lake waters in this watershed, all classified FW.

Surface Water Quality

Station #	Type	Class	Description
SV-249	P	FW	LAKE HARTWELL HEADWATERS, KEOWEE RIVER ARM AT SC 183
SV-205	W/BIO	FW	SIXMILE CREEK AT S-39-160
SV-683	BIO	FW	WILDCAT CREEK AT CLEMSON UNIV. REC. AREA OFF SC 133
SV-360	W	FW	LAKE ISSAQUEENA, FOREBAY EQUIDISTANT FROM DAM AND SHORELINE
SV-106	S	FW	MARTIN CREEK ARM OF LAKE HARTWELL AT S-37-65 N OF CLEMSON
SV-288	P	FW	L. HARTWELL, SENECA R. ARM AT USACE BUOY BETW MRKRS S-28A & S-29
SV-180	BIO	FW	SIX AND TWENTY CREEK AT S-04-174
SV-181	S	FW	SIX AND TWENTY CREEK AT S-04-29, 8.2 MI SE OF PENDLETON
SV-339	P	FW	LAKE HARTWELL, SENECA R. ARM AT USACE BUOY BETW MRKRS S-14 & S-15

Sixmile Creek (SV-205) – Aquatic life uses are fully supported based on macroinvertebrate community, physical, and chemical data. Recreational uses are partially supported due to fecal coliform bacteria excursions.

Wildcat Creek (SV-683) - Aquatic life uses are fully supported based on macroinvertebrate community data.

Lake Issaqueena (SV-360) - Aquatic life and recreational uses are fully supported. Although pH excursions occurred, due to the small number of samples, aquatic life uses are considered to be fully supported.

Six and Twenty Creek – There are two monitoring sites along Six and Twenty Creek. Aquatic life uses are fully supported at the upstream site ***(SV-180)*** based on macroinvertebrate community data. At the downstream site ***(SV-181),*** aquatic uses are also fully supported; however, there are significant increasing trends in turbidity and total phosphorus concentrations. Recreational uses are partially supported at this site due to fecal coliform bacteria excursions.

Lake Hartwell - There are four monitoring sites along Lake Hartwell in this watershed. Recreational uses are fully supported **at all sites,** and significant decreasing trends in fecal coliform bacteria concentration suggest improving conditions for this parameter.

Aquatic life uses are fully supported at the Keowee River site ***(SV-249)***; however, there is a significant decreasing trend in dissolved oxygen concentration. Significant decreasing trends in five-day biological oxygen demand, turbidity, and total nitrogen concentration suggest improving conditions for these parameters. Aquatic life uses are also fully supported at the Martin Creek arm site ***(SV-106)***. A significant decreasing trend in five-day biochemical oxygen demand suggests improving conditions for this parameter.

Further downlake in the Seneca River arm ***(SV-288)***, aquatic life uses are fully supported. There is a significant increasing trend in pH. Significant decreasing trends in five-day biochemical oxygen demand, turbidity, and total nitrogen concentration suggest improving conditions for these parameters. In sediments, a high concentration of copper was detected in 1997 & 1999 samples. A high concentration of lead was also detected in the 1997 sample. Very high concentrations of chromium, lead, and zinc were detected in the 1999 sample. P,P'DDD and P,P'DDE, both metabolites of DDT, were detected in the 1999 sediment sample. Although the use of DDT was banned in 1973, it is very persistent in the environment. PCB 1248 was detected in the 1999 sediment sample. PCB 1254 was detected in the 1996 and 1999 sediment samples. Although the manufacture and use of PCBs was banned in 1979, they are also very persistent in the environment.

At the furthest downlake site in the Seneca River arm, near the confluence with Six and Twenty Creek ***(SV-339),*** aquatic life uses are also fully supported; however, there are significant increasing trends in pH and total phosphorus concentration. Significant decreasing trends in five-day biochemical oxygen demand, turbidity, and total nitrogen concentration suggest improving conditions for these parameters.

Natural Swimming Areas

FACILITY NAME ***RECEIVING STREAM***	***PERMIT #*** ***STATUS***
DARWIN WRIGHT SIX AND TWENTY CREEK	04-N09 ACTIVE
FOOTHILLS YMCA LAKE HARTWELL	37-N07 ACTIVE

A fish consumption advisory has been issued by the Department for PCBs (Polychlorinated biphenols) and includes Lake Hartwell and the Seneca River arm of Lake Hartwell within this watershed (see advisory p.37).

NPDES Program

Active NPDES Facilities

RECEIVING STREAM FACILITY NAME PERMITTED FLOW @ PIPE (MGD)	NPDES# TYPE COMMENT
KEOWEE RIVER TRIBUTARY DUKE POWER/OCONEE NUCLEAR PIPE #:002 FLOW: 3.7	SC0000515 MAJOR INDUSTRIAL
KEOWEE RIVER (INTERNAL) DUKE POWER/OCONEE NUCLEAR PIPE #:003 FLOW: 0.057 PIPE #:005 FLOW: 0.0 PIPE #:006 FLOW: 0.005	SC0000515 MAJOR INDUSTRIAL
KEOWEE RIVER TAILRACE DUKE POWER/OCONEE NUCLEAR PIPE #:004 FLOW: 2.9	SC0000515 MAJOR INDUSTRIAL
LAKE HARTWELL WESTPOINT STEVENS/CLEMSON PLT PIPE #: 001 FLOW: 1.9 (TIER I) PIPE #: 001 FLOW: 2.3 (TIER I)	SC0000591 MAJOR INDUSTRIAL
LAKE HARTWELL CLEMSON UNIVERSITY WWTP PIPE #: 001 FLOW: 1.8	SC0034843 MAJOR DOMESTIC
LAKE HARTWELL HARBOR GATE CONDOMINIUMS PIPE #: 001 FLOW: 0.0375	SC0021849 MINOR DOMESTIC
LAKE HARTWELL MILLIKEN & CO./DEFORE PLT PIPE #: 001 FLOW: 0.001	SC0023353 MINOR INDUSTRIAL
LAKE HARTWELL SHOALS SEWER CO. PIPE #: 001 FLOW: 0.04	SC0021873 MINOR DOMESTIC
LAKE HARTWELL CLEMSON UNIVERSITY/CENTRAL ENERGY PIPE #: 001 FLOW: 14.11	SC0022004 MINOR INDUSTRIAL
LAKE HARTWELL TRIBUTARY ECONOMY LODGE WWTP PIPE #: 001 FLOW: 0.025	SC0023311 MINOR DOMESTIC

LAKE HARTWELL TRIBUTARY CLEMSON UNIVERSITY/COOPER SER.LAB. PIPE #: 001 FLOW: 0.001	SC0036200 MINOR INDUSTRIAL
SALEM CREEK SPRINGS IND./WAMSUTTA PLT PIPE #: 001,01A FLOW: M/R	SCG250008 MINOR INDUSTRIAL
SIX AND TWENTY CREEK ANDERSON CO. SEWER AUTH. PIPE #: 001 FLOW: 0.5	SC0040193 MINOR DOMESTIC

Nonpoint Source Management Program

Land Disposal Activities

Landfill Facilities

LANDFILL NAME ***FACILITY TYPE***	***PERMIT #*** ***STATUS***
WHITE LAND CLEARING C & D	372649-1701 ACTIVE
JP STEVENS & CO.- DELTA #1 INDUSTRIAL	373317-1601 (IWP-104) --------
BAD LONG TERM C&D LANDFILL C & D	042629-1201 (042902-1301) INACTIVE
WEDGEWOOD LC&D , YARD TRASH	042485-1701 INACTIVE
MCCLELLION/MEEHAN ST C & D	042477-1301 INACTIVE
CLEMSON UNIVERSITY LONG TERM C & D, LCD	041804-1202 ACTIVE
DUKE POWER-BAD CREEK INDUSTRIAL	IWP-294; IWP-234 ACTIVE

Mining Activities

MINING COMPANY ***MINE NAME***	***PERMIT #*** ***MINERAL***
WILLIAM R.P. WILSON WILSON BORROW PIT	1091-73 CLAY

Water Quantity

WATER USER ***STREAM***	***TOTAL PUMP. CAPACITY (MGD)*** ***RATED PUMP. CAPACITY (MGD)***
ANDERSON REGIONAL SIX AND TWENTY CREEK	43.0 26.5

Growth Potential

There is a moderate to high potential for growth in this watershed, which contains portions of the Town of Six Mile and the Cities of Clemson and Anderson. Residential growth should occur along S.C. Hwy 133 from Clemson to Six Mile. Another growth area surrounds the intersection of I-85 and S.C. Hwy 81, near Six and Twenty Creek. The presence of I-85 and four-lane U.S. Hwy 76 to the west of Anderson are attracting industrial growth. Clemson is one of the largest manufacturing areas in the upstate region. Future growth of the manufacturing industry is dependent on infrastructure expansion, which is dependent on the capacity of existing facilities to treat the effluent, and on the assimilative capacity of surrounding streams to absorb the effluent. Several wastewater treatment facilities in the area have been expanded and are able to serve expanding industrial growth.

03060101-050

(Little River/Lake Keowee)

General Description

Watershed 03060101-050 is located in Oconee County and consists primarily of the ***Little River*** and its tributaries as it flow through ***Lake Keowee***. The watershed occupies 104,984 acres of the Blue Ridge and Piedmont regions of South Carolina. The predominant soil types consist of an association of the Pacolet-Cecil-Hiwassee series. The erodibility of the soil (K) averages 0.24, and the slope of the terrain averages 19%, with a range of 2-80%. Land use/land cover in the watershed includes: 78.4% forested land, 8.6% agricultural land, 8.4% water, 3.4% urban land, 0.4% forested wetland, 0.1% nonforested wetland, and 0.7% barren land.

Burgess Creek (Long Branch) and Mill Creek join to form the North Fork Little River, which accepts drainage from Smeltzer Creek, Fiddlers Creek, and Barbeque Branch. Cherokee Creek accepts drainage from White Rock Creek (Bee Cave Creek, Wilson Creek, Pack Branch) and Townes Creek. Moody Creek (Cantrell Creek, White Oak Creek) flows through Cherokee Lake before joining Townes Creek (West Fork, Crane Creek, Wash Branch, Crossland Creek) in Lake Isaquenna (Jumping Branch). Townes Creek flows out of Lake Isaquenna and accepts drainage from Mud Creek before merging with Tamassee Creek (Horse Bone Branch) to form the Flat Shoals River. Flat Shoals River then accepts drainage from Reece Branch and Davey Branch before merging with the North Fork Little River to form the Little River.

Downstream of the confluence, the Little River accepts drainage from Oconee Creek (Alexander Creek, Station Creek), Yarborough Branch, Camp Bottom Branch, and Todd Branch before the river begins to impound into Lake Keowee. Beaman Branch enters the river next, followed by Neal Branch, Wilson Branch, Whetstone Creek, and Stamp Creek (Davis Branch, Cornhouse Creek). The river then accepts drainage from Long Branch, Barkshed Branch, Von Hollen Creek (Frenge Branch), Big Creek, and Crooked Creek (Cater Branch). Cane Creek (Walhalla Reservoir) accepts drainage from Browns Lake, Little Cane Creek (Beaty Creek, Williams Creek), and Dodgens Creek before flowing into the Little River near the base of the watershed.

Lake Keowee, divided between 03060101-030 (Keowee River) and this watershed, is connected through a narrow channel bisected by S.C. Hwy 130. Waters flowing through this connection flow out of the Keowee dam at the base of 030060101-030 and into the Keowee River in 03060101-040. The Little River Dam is located near the confluence with Cane Creek at the base of this watershed and discharges waters into a segment of the Little River, which flows into the Keowee River in 03060101-040. There are a total of 197.7 stream miles and 10,104.5 acres of lake waters in this watershed, all classified FW.

Surface Water Quality

Station #	Type	Class	Description
SV-684	BIO	FW	CRANE CREEK AT WINDING STAIRS RD
SV-743	BIO	FW	FLAT SHOALS RIVER AT S-37-129

SV-742	BIO	FW	OCONEE CREEK AT S-37-129
SV-203	S	FW	LITTLE RIVER AT S-37-24 7.1 MI NE OF WALHALLA
SV-312	P	FW	LAKE KEOWEE AT SC 188 – CROOKED CK ARM 4.5 MI N SENECA
SV-343	W/BIO	FW	LITTLE CANE CREEK AT S-37-133
SV-342	W/BIO	FW	CANE CREEK AT S-37-133
SV-311	P	FW	LAKE KEOWEE AT SC 188 – CANE CK ARM 3.5 MI NW SENECA

Crane Creek (SV-684) – Aquatic life uses are fully supported based on macroinvertebrate community data.

Flat Shoals River (SV-743) - Aquatic life uses are fully supported based on macroinvertebrate community data.

Oconee Creek (SV-742) - Aquatic life uses are fully supported based on macroinvertebrate community data.

Little River (SV-203) – Aquatic life uses are fully supported and a significant decreasing trend in turbidity suggests improving conditions for this parameter. Recreational uses are fully supported.

Little Cane Creek (SV-343) - Aquatic life uses are fully supported based on macroinvertebrate community, physical, and chemical data. Recreational uses are not supported due to fecal coliform bacteria excursions.

Cane Creek (SV-342) - Aquatic life uses are fully supported based on macroinvertebrate community, physical, and chemical data. Recreational uses are not supported due to fecal coliform bacteria excursions.

Lake Keowee – There are two monitoring sites along Lake Keowee in this watershed. Recreational uses are fully supported and a significant decreasing trend in fecal coliform bacteria concentration suggests improving conditions for this parameter **at both sites**. Aquatic life uses are fully supported at the Crooked Creek arm site ***(SV-312)***; however, there is a significant decreasing trend in dissolved oxygen concentration and significant increasing trends in pH and total phosphorus concentration. Aquatic life uses are also fully supported at the Cane Creek arm site ***(SV-311),*** although there is a significant decreasing trend in dissolved oxygen concentration and a significant increasing trend in total phosphorus concentration. Significant decreasing trends for five-day biological oxygen demand, turbidity, and total nitrogen concentration suggest improving conditions for these parameters **at both sites**.

In an effort to suppress the growth of *Hydrilla* and to minimize its spread within the lake and adjacent public waters, and to minimize adverse impacts to water use activities, the lake was drawn down in the fall/winter and aquatic herbicides were applied in 1998 and planned for 2003.

NPDES Program

Active NPDES Facilities

RECEIVING STREAM ***FACILITY NAME*** ***PERMITTED FLOW @ PIPE (MGD)***	***NPDES#*** ***TYPE*** ***COMMENT***
CANE CREEK TORRINGTON WWTP PIPE #: 001 FLOW: M/R	SCG250048 MINOR INDUSTRIAL
DAVEY BRANCH TAMASSEE DAR SCHOOL PIPE #: 001 FLOW: 0.031	SC0026727 MINOR DOMESTIC
LAKE KEOWEE KENDALL HEALTHCARE/SENECA PIPE #: 001 FLOW: M/R	SCG250067 MINOR INDUSTRIAL
LAKE KEOWEE LAKE KEOWEE UTIL. SYS., INC. PIPE #: 001 FLOW: 0.90	SC0022322 MINOR DOMESTIC
LAKE KEOWEE CITY OF SENECA WTP PIPE #: 001 FLOW: M/R	SCG641010 MINOR INDUSTRIAL

Nonpoint Source Management Program

Land Disposal Activities

Landfill Facilities

LANDFILL NAME ***FACILITY TYPE***	***PERMIT #*** ***STATUS***
TORRINGTON COMPANY INDUSTRIAL	IWP-120 (SCD003344918) ----------
FLAT ROCK LANDCLEARING & YD FILL C &D	372664-1701 INACTIVE
NORTHWEST GRADING LANDCLEARING C & D	372614-1701 ACTIVE

Water Quantity

WATER USER ***STREAM***	***TOTAL PUMP. CAPACITY (MGD)*** ***RATED PUMP. CAPACITY (MGD)***
CITY OF SENECA INTAKE LAKE KEOWEE	18.0 12.0

Growth Potential

There is a moderate potential for growth in this watershed, which contains the Town of Salem and portions of the Cities of Walhalla and Seneca. Salem and the shoreline of Lake Keowee are predicted for growth in the form of retirement communities. S.C. Hwy 130, running from Salem to Seneca, will be particularly prone to development. The Sumter National Forest extends across the upper portion of the watershed and would limit growth in that area.

Watershed Protection and Restoration Strategies

Special Projects

Formation of the Oconee-Pickens Clean Water Action (OPCWA) by the Friends Of Lake Keowee Society (FOLKS) – Midpoint Project Report

A 5-year, §319 grant from EPA was awarded to Friends Of Lake Keowee Society (FOLKS) in July 1999. The grant enabled the formation of Oconee-Pickens Clean Water Action (OPCWA), a partnership of conservation interests that includes Clemson University, S.C. Forestry Commission, USDA/NRCS, county governments, Duke Energy, and citizens of Oconee and Pickens Counties. FOLKS serves as the lead organization, providing project management, volunteer support, and partial funding. The objective of OPCWA is to improve impaired waterways in the Lake Keowee watershed, by reducing nonpoint sources of fecal coliform and metals. Education and public awareness regarding nonpoint sources were also targeted. At project start, the designated impairments included fecal coliform in Cane Creek, Little Cane Creek, and Little Eastatoe Creek and metals in Big Eastatoe Creek and parts of Lake Keowee.

The strategy for improvement was to first locate and prioritize pollution "hot spots" through rounds of water testing and land use survey; and then to bring best management practices (BMPs) to remediate the associated pollution sources. This is being done through a combination of educational outreach and cost sharing for BMP implementation. Pollution sources identified and targeted in the impaired areas included mine and marine wastes, unbuffered timber and livestock operations, waterside landscapes, and waterside communities on septic systems.

03060101-060

(Twelvemile Creek)

General Description

Watershed 03060101-060 is located in Pickens County and consists primarily of ***Twelvemile Creek*** and its tributaries from its origin to its confluence with Golden Creek. The watershed occupies 67,805 acres of the Blue Ridge and Piedmont regions of South Carolina. The predominant soil types consist of an association of the Cecil-Hiwassee-Pacolet series. The erodibility of the soil (K) averages 0.25, and the slope of the terrain averages 14%, with a range of 2-80%. Land use/land cover in the watershed includes: 72.5% forested land, 20.3% agricultural land, 6.1% urban land, 0.5% barren land, 0.4% water, and 0.2% forested wetland.

Middle Fork Twelvemile Creek (Big Rock Lake, Youngs Branch, Blacks Branch, Mill Shoals Creek, California Branch, Adams Creek) and North Fork (Findleys Lake, Hagood Branch) join to form Twelvemile Creek. Downstream from the confluence, Twelvemile Creek accepts drainage from Town Creek, Cannon Creek (Gregory Creek, West Fork, Hayes and Collins Lake), Wolf Creek (Raven Branch), Praters Creek, and Rices Creek (Country Club Lake). There are a total of 135.1 stream miles and 273.8 acres of lake waters in this watershed, all classified FW.

Surface Water Quality

Station #	Type	Class	Description
SV-206	S/BIO	FW	North Fork at US 178, 2.9 mi N of Pickens
SV-282	SED	FW	Twelvemile Creek at S-39-273, 2.8 mi SSW of Pickens
SV-740	BIO	FW	Rices Creek at S-39-158
SV-739	BIO	FW	Twelvemile Creek at S-39-137

North Fork (SV-206) – Aquatic life uses are fully supported based on macroinvertebrate community, physical, and chemical data; however, there are significant increasing trends in pH and turbidity. A significant decreasing trend in five-day biochemical oxygen demand suggests improving conditions for this parameter. Recreational uses are partially supported due to fecal coliform bacteria excursions. In addition, there is a significant increasing trend in fecal coliform bacteria concentration.

Rices Creek (SV-740) **–** Aquatic life uses are fully supported based on macroinvertebrate community data.

Twelvemile Creek **–** There are two monitoring sites along Twelvemile Creek in this watershed. Only sediment samples are collected at the upstream site ***(SV-282)***. P,P'DDE, a metabolite of DDT, was detected in the 1998 sediment sample. Although the use of DDT was banned in 1973, it is very persistent in the environment. PCB 1248 was detected in the 1998 and 1999 sediment samples. PCB 1254 was detected in the 1997 sediment sample. Although the manufacture and use of PCBs was banned in 1979, they are also very persistent in the environment. At the downstream site ***(SV-739),*** aquatic life uses are fully supported based on macroinvertebrate community data.

A fish consumption advisory has been issued by the Department for PCBs (Polychlorinated biphenols) and includes Twelvemile Creek within this watershed (see advisory p.37).

NPDES Program

Active NPDES Facilities

RECEIVING STREAM ***FACILITY NAME*** ***PERMITTED FLOW @ PIPE (MGD)***	***NPDES#*** ***TYPE*** ***COMMENT***
PRATERS CREEK SPANGLERS GROCERY PIPE #: 001 FLOW: 0.002	SC0000434 MIN0R INDUSTRIAL
RICES CREEK ALICE MFG/FOSTER & ELLJEAN PLT PIPE #: 001 FLOW: 0.055 (PHASE I) PIPE #: 001 FLOW: 0.063425 (PHASE II) PIPE #: 002 FLOW: 0.008425	SC0000370 MIN0R INDUSTRIAL
TOWN CREEK OWT INDUSTRY, INC. PIPE #: 001, 01A FLOW: 0.037	SC0026492 MIN0R INDUSTRIAL
TOWN CREEK SCHLUMBERGER INDUSTRIES PIPE #: 001 FLOW: 0.043	SC0046612 MIN0R INDUSTRIAL
TOWN CREEK TRIBUTARY KENT MANUFACTURING CO. PIPE #: 001, 002 FLOW: M/R	SCG250154 MIN0R INDUSTRIAL
TWELVEMILE CREEK TOWN OF PICKENS/12MILE & WOLF CK REG TRT FAC. PIPE #: 001 FLOW: 0.95	SC0047716 MIN0R DOMESTIC
TWELVEMILE CREEK PICKENS COUNTY STOCKADE LAGOON PIPE #: 001 FLOW: 0.06	SC0047899 MIN0R DOMESTIC
MIDDLE FORK TWELVEMILE CREEK TOWN OF PICKENS/WTP PIPE #: 001 FLOW: M/R	SCG643004 MIN0R INDUSTRIAL
WOLF CREEK SANGAMO/BREAZEALE NPL SITE PIPE #: 001 FLOW: 0.13	SC0047198 MIN0R INDUSTRIAL

Nonpoint Source Management Program

Land Disposal Activities

Landfill Facilities

LANDFILL NAME / ***FACILITY TYPE***	***PERMIT #*** / ***STATUS***
SANGAMO/ERNEST NIX PROPERTY INDUSTRIAL	IWP-139 (SCD003344918) INACTIVE
PICKENS HIGH SCHOOL SHORT TERM LANDFILL	392900-1302 INACTIVE

Land Application Sites

LAND APPLICATION SYSTEM / ***FACILITY NAME***	***ND#*** / ***TYPE***
PERCOLATION POND MONTE VISTA SD	ND0067407 DOMESTIC

Water Quantity

WATER USER / ***STREAM***	***TOTAL PUMP. CAPACITY (MGD)*** / ***RATED PUMP. CAPACITY (MGD)***
TOWN OF PICKENS CITY RESERVOIR/NORTH FORK	10.6 5.3
TOWN OF PICKENS TWELVEMILE CREEK	4.0 2.0

Growth Potential

There is a moderate potential for growth in this watershed, which contains portions of the Town of Pickens and a portion of the City of Easley. Commercial growth is predicted between Pickens and Easley along S.C. Hwy 8. Residential growth has the potential to increase, as does industrial growth. Industrial growth is this watershed is due to the established infrastructure and transportation system, and the proximity of I-85 to the industrial community.

03060101-070

(Twelvemile Creek/Lake Hartwell)

General Description

Watershed 03060101-070 is located in Pickens County and consists primarily of ***Twelvemile Creek*** and its tributaries from Golden Creek to its confluence with the Keowee River forming an arm of ***Lake Hartwell***. The watershed occupies 31,043 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Cecil-Hiwassee series. The erodibility of the soil (K) averages 0.26, and the slope of the terrain averages 10%, with a range of 2-25%. Land use/land cover in the watershed includes: 71.7% forested land, 14.8% agricultural land, 8.6% urban land, 2.3% water, 1.3% forested wetland, and 1.3% barren land.

This section of Twelvemile Creek accepts drainage from Golden Creek (Murphey Branch), Shoal Creek, Camp Creek, Huggins Creek, Todd Creek, and Pike Creek before forming an arm of Lake Hartwell. There are a total of 53.8 stream miles and 735.3 acres of lake waters within this watershed, all classified FW.

Surface Water Quality

Station #	Type	Class	Description
SV-239	S	FW	GOLDEN CREEK AT S-39-222, 1.2 MI NW OF LIBERTY
SV-738	BIO	FW	GOLDEN CREEK AT GOLDEN CREEK ROAD
SV-015	P	FW	TWELVEMILE CREEK AT S-39-51, N OF NORRIS
SV-137	P	FW	TWELVEMILE CREEK AT S-39-337
SV-136	S	FW	1ST UNNAMED CREEK AFTER LEAVING CENTRAL AT CLVT ON MAW BRIDGE RD
SV-107	P	FW	TWELVEMILE CREEK ARM OF LAKE HARTWELL AT SC 133

Twelvemile Creek - There are three monitoring sites along Twelvemile Creek in this watershed. Aquatic life uses are fully supported at the upstream site ***(SV-015),*** and a significant decreasing trend in five-day biochemical oxygen demand suggests improving conditions for this parameter. Recreational uses are not supported at this site due to fecal coliform bacteria excursions. In addition, there is a significant increasing trend in fecal coliform bacteria concentration.

Further downstream ***(SV-137)***, aquatic life uses are fully supported. A significant increasing trend in dissolved oxygen concentration and significant decreasing trends in five-day biochemical oxygen demand and turbidity suggest improving conditions for these parameters. PCB 1248 was detected in the 1999 sediment sample, and PCB 1254 was detected in the 1997 and 1999 sediment samples. Although the manufacture and use of PCBs was banned in 1979, they are very persistent in the environment. Recreational uses are partially supported at this site due to fecal coliform bacteria excursions.

At the furthest downstream location in the impounded area of Lake Hartwell ***(SV-107),*** aquatic life uses are fully supported; however, there is a significant decreasing trend in dissolved oxygen concentration. A significant decreasing trend in five-day biochemical oxygen demand suggests improving conditions for this parameter. A very high concentration of chromium was detected in the 1999 sediment sample, and PCB 1254 was detected in the 1996 sediment sample. Recreational uses are fully supported at this site, and a significant decreasing trend in fecal coliform bacteria concentration suggests improving conditions for this parameter.

Unnamed Twelvemile Creek Tributary (SV-136) - Aquatic life uses are fully supported; however, there is a significant increasing trend in total phosphorus concentration. Significant decreasing trends in five-day biochemical oxygen demand and turbidity suggest improving conditions for these parameters. Recreational uses are partially supported due to fecal coliform bacteria excursions. In addition, there is a significant increasing trend in fecal coliform bacteria concentration.

Golden Creek - There are two monitoring sites along Golden Creek. Aquatic life uses are fully supported at the upstream site ***(SV-239)***; however, there is a significant increasing trend in turbidity. A significant decreasing trend in five-day biochemical oxygen demand suggests improving conditions for this parameter. Recreational uses are not supported at this site due to fecal coliform bacteria excursions. At the downstream site ***(SV-738)***, aquatic life uses are fully supported based on macroinvertebrate community data.

A fish consumption advisory has been issued by the Department for PCBs (Polychlorinated biphenols) and includes Twelvemile Creek and the impounded area (Lake Hartwell) of Twelvemile Creek within this watershed (see advisory p.37).

NPDES Program

Active NPDES Facilities

RECEIVING STREAM ***FACILITY NAME*** ***PERMITTED FLOW @ PIPE (MGD)***	***NPDES#*** ***TYPE*** ***COMMENT***
LAKE HARTWELL/TWELVEMILE CREEK ARM CLEMSON UNIVERSITY/MAIN PLT WWTP PIPE #: 001 FLOW: 1.15	SC0020010 MINOR DOMESTIC
LAKE HARTWELL/TWELVEMILE CREEK ARM DANIEL HIGH SCHOOL/PICKENS CO. PIPE #: 001 FLOW: 0.02	SC0038652 MINOR DOMESTIC
LAKE HARTWELL/TWELVEMILE CREEK ARM RC EDWARDS JR HIGH SCHOOL PIPE #: 001 FLOW: 0.018	SC0028762 MINOR DOMESTIC
LAKE HARTWELL TRIBUTARY ISAQUEENA MOBILE HOME PARK PIPE #: 001 FLOW: 0.024	SC0023141 MINOR DOMESTIC
HUGGINS CREEK BASF CORP./FIBERS DIV./CLEMSON PIPE #: 002 FLOW: 0.053	SC0000302 MAJOR INDUSTRIAL
TWELVEMILE CREEK	SC0000302

BASF CORP./FIBERS DIV./CLEMSON PIPE #: 001 FLOW: 0.114	MAJOR INDUSTRIAL
TWELVEMILE CREEK CATEECHEE VILLAGE INC. WWTP PIPE #: 001 FLOW: 0.02	SC0022012 MINOR DOMESTIC
TWELVEMILE CREEK TRIBUTARY PICKENS COUNTY PSC/CENTRAL/NORTH PLT PIPE #: 001 FLOW: 0.15	SC0024996 MINOR DOMESTIC
TWELVEMILE CREEK TRIBUTARY MASSINGILL TRAILER COURT PIPE #: 001 FLOW: 0.0024	SC0027049 MINOR DOMESTIC
GOLDEN CREEK PICKENS COUNTY-LIBERTY/ROPER LAGOON PIPE #: 001 FLOW: 0.50	SC0026191 MINOR DOMESTIC
GOLDEN CREEK CITY OF EASLEY/GOLDEN CREEK LAGOON PIPE #: 001 FLOW: 0.58	SC0023035 MINOR DOMESTIC
GOLDEN CREEK VULCAN MATERIALS CO. PIPE #: 001 FLOW: M/R	SCG730065 MINOR INDUSTRIAL
MURPHEY BRANCH PICKENS COUNTY-LIBERTY/CRAMER LAGOON PIPE #: 001 FLOW: 0.157	SC0026166 MINOR DOMESTIC
PIKE CREEK AMERICAN HOUSE SPINNING PIPE #: 001 FLOW: 0.0013	SC0000132 MINOR INDUSTRIAL

Nonpoint Source Management Program

Land Disposal Activities

Landfill Facilities

LANDFILL NAME ***FACILITY TYPE***	***PERMIT #*** ***STATUS***
PICKENS COUNTY LANDFILL DOMESTIC	DWP-086; DWP-034; 391001-1201 CLOSED
PICKENS COUNTY TRANSFER STATION TRANSFER STATION	391001-6001 ACTIVE
PICKENS COUNTY LANDFILL DOMESTIC	391001-1101 ACTIVE
THRIFT DEVELOPMENT LCD LANDFILL LC&D	392702-1701 ACTIVE

Mining Activities

MINING COMPANY	***PERMIT #***

MINE NAME	*MINERAL*
VULCAN CONSTRUCTION CO. LIBERTY QUARRY	0060-77 GRANITE

Water Quantity

WATER USER *STREAM*	*TOTAL PUMP. CAPACITY (MGD)* *RATED PUMP. CAPACITY (MGD)*
CITY OF EASLEY CENTRAL WD TWELVEMILE CREEK	4.0 2.0

Growth Potential

There is a moderate to high potential for growth in this watershed, which contains portions of the Towns of Six Mile, Central, Norris, and Liberty and the Cities of Clemson and Easley. This growth will occur, provided there is sufficient infrastructure to accommodate it. The residential growth trend is eastward from Clemson to Central, Liberty, and Easley along S.C. Hwy 93 and U.S. Hwy 123. Easley has the greatest potential for commercial growth due to its proximity to S.C. 93, 153, and 8, and U.S. 123. Industrial growth in this watershed is due, in part, to the established infrastructure and transportation system, and the proximity of I-85. The topography of Easley is most conducive to industrial development and gives it the highest potential for growth in this area. The Town of Liberty also has a high potential for industrial growth due to the large tracts in the Liberty vicinity that are projected to develop, pending the construction of new or expanded sewage disposal plants in the area. Construction of these will encourage growth along the U.S. 123 corridor as well.

03060101-080

(Coneross Creek/Lake Hartwell)

General Description

Watershed 03060101-080 is located in Oconee County and consists primarily of ***Coneross Creek*** and its tributaries, which form an arm of ***Lake Hartwell***. The watershed occupies 68,113 acres of the Blue Ridge and Piedmont regions of South Carolina. The predominant soil types consist of an association of the Cecil-Hiwassee series. The erodibility of the soil (K) averages 0.26, and the slope of the terrain averages 11% with a range of 2-25%. Land use/land cover in the watershed includes: 64.0% forested land, 25.6% agricultural land, 6.5% urban land, 2.9% water, 0.8% forested wetland, and 0.2% barren land.

Coneross Creek flows through Coneross Creek Reservoir and accepts the drainage of White Fork. Negro Fork (Negro Fork Reservoir) enters Coneross Creek next, followed by Bear Swamp Creek, Colonels Fork Creek, Richland Creek (Halfway Branch), Perkins Creek, Snow Creek, and Speeds Creek before forming an arm of Lake Hartwell. There are a total of 136.0 stream miles and 2,546.3 acres of lake waters in this watershed, all classified FW.

Surface Water Quality

Station #	Type	Class	Description
SV-333	P	FW	CONEROSS CREEK AT S-37-13
SV-004	P	FW	CONEROSS CREEK AT SC 59
SV-236	P	FW	CONEROSS CK ARM OF LAKE HARTWELL AT S-37-184, 6.5 MI SSE OF SENECA

Coneross Creek - There are three monitoring sites along Coneross Creek. At the upstream site ***(SV-333***), aquatic life uses are partially supported due to copper excursions. There is also a significant increasing trend in total phosphorus concentration. A significant increasing trend in dissolved oxygen concentration and a significant decreasing trend in turbidity suggest improving conditions for these parameters. Recreational uses are partially supported due to fecal coliform bacteria excursions.

Further downstream ***(SV-004),*** aquatic life uses are not supported due to copper excursions. There are also significant increasing trends in total phosphorus and total nitrogen concentrations. Significant decreasing trends five-day biochemical oxygen demand and turbidity suggest improving conditions for these parameters. Recreational uses are partially supported due to fecal coliform bacteria excursions. In addition, there is a significant increasing trend in fecal coliform bacteria concentration.

Aquatic life uses are fully supported at the site located in the Coneross Creek arm of Lake Hartwell ***(SV-236)***; however, there is a significant decreasing trend in dissolved oxygen concentration. Significant decreasing trends in five-day biochemical oxygen demand and turbidity suggest improving conditions for these parameters. Recreational uses are fully supported at this site and a significant decreasing trend in fecal coliform bacteria concentration suggests improving conditions for this parameter.

A total maximum daily load (TMDL) has been developed for both SV-333 and SV-004 to address these impairments (see Watershed Protection and Restoration Strategies below).

A fish consumption advisory has been issued by the Department for PCBs (Polychlorinated biphenols) and includes the impounded area (Lake Hartwell) of Coneross Creek within this watershed (see advisory p.37).

Groundwater Quality

Well #	Class	Aquifer	Location
AMB-070	GB	SAPROLITE	MOUNTAIN REST DEEP
AMB-081	GB	PIEDMONT BEDROCK	MOUNTAIN REST SHALLOW

NPDES Program

Active NPDES Facilities

RECEIVING STREAM / FACILITY NAME / PERMITTED FLOW @ PIPE (MGD)	NPDES# / TYPE / COMMENT
CONEROSS CREEK OCONEE COUNTY/CONEROSS CREEK WWTP PIPE #: 001 FLOW: 7.80	SC0033553 MAJOR DOMESTIC
CONEROSS CREEK CITY OF WALHALLA/CONEROSS CREEK PIPE #: 001 FLOW: M/R	SCG641004 MINOR DOMESTIC
CONEROSS CREEK OCONEE MEMORIAL HOSPITAL PIPE #: 001 FLOW: 0.015	SCG250100 MINOR INDUSTRIAL
BEAR SWAMP CREEK TRIBUTARY AVONDALE MILLS/WALHALLA PLT PIPE #: 001 FLOW: 0.0158	SCG250114 MINOR INDUSTRIAL

Nonpoint Source Management Program

Land Disposal Activities

Landfill Facilities

LANDFILL NAME / FACILITY TYPE	PERMIT # / STATUS
OCONEE COUNTY LANDFILL DOMESTIC	371001-1102 (DWP-084) INACTIVE
LAKE VIEW LANDFILL DOMESTIC	DWP-043 INACTIVE
OCONEE COUNTY LANDFILL DOMESTIC	371001-1101 INACTIVE
DUKE POWER-OCONEE NUCLEAR LANDFILL INDUSTRIAL	IWP-239 INACTIVE
DUKE POWER-OCONEE NUCLEAR LANDFILL INDUSTRIAL	373303-1601 (SCD043979822) ACTIVE

HURDT LAND-CLEARING LANDFILL C &D	372494-1701 INACTIVE
JP STEVENS & CO.-WEST POINT PEPPERAL INDUSTRIAL	IWP-135; IWP-186 INACTIVE
CITY OF SENECA C&D DOMESTIC	371001-1201 ACTIVE
CITY OF SENECA C&D DOMESTIC	DWP-041 INACTIVE
CITY OF SENECA TRANSFER STATION TRANSFER STATION	371001-6001 ACTIVE

Mining Activities

MINING COMPANY ***MINE NAME***	***PERMIT #*** ***MINERAL***
OCONEE COUNTY OCONEE COUNTY ROCK QUARRY	0253-73 GRANITE

Water Quantity

WATER USER ***STREAM***	***TOTAL PUMP. CAPACITY (MGD)*** ***RATED PUMP. CAPACITY (MGD)***
CITY OF WALHALLA CONEROSS CREEK	4.3 2.9
CITY OF WALHALLA NEGRO FORK	0.1 0.1

Growth Potential

There is a moderate to high potential for growth in this watershed, which contains portions of the Cities of Walhalla and Seneca and the Town of Westminster. Residential, commercial, and industrial growth is expected along the U.S. Hwy 123 corridor from Westminster through Seneca to Clemson, as well as along S.C. Hwy 28 from Seneca through West Union to Walhalla.

Seneca, in particular, is considered one of the largest manufacturing areas in the upstate region. Growth of the manufacturing industry is dependent on infrastructural expansion, which is dependent on the capacity of existing facilities. The regional wastewater treatment facility has expanded and is able to support future growth.

Watershed Protection and Restoration Strategies

Total Maximum Daily Loads (TMDLs)

A TMDL was developed to determine the maximum amount of fecal coliform bacteria Coneross Creek can receive from point and nonpoint sources and still meet water quality standards. EPA's

BASINS model (HSPF) was used to calculate the continuous in-stream concentration of fecal coliform bacteria. Based on this estimation, we calculated the sum of the allowable loads of the single pollutant from all contributing point and nonpoint sources. This TMDL includes a margin of safety and seasonality to ensure that the waterbody can be used for the recreational use purposes that the State has designated. This TMDL recommends a reduction of 50% in the loading from unidentified sources, which includes sanitary sewers overflows, leaking sanitary sewers, failing septic systems, and direct discharges.

Special Projects

TMDL Implementation Underway in Coneross Creek/ Beaverdam Creek Watersheds

Funded through a §319 grant from EPA, a new effort to combat bacterial pollution in two adjacent watersheds in Oconee County began in December 2002. Acting as lead organization, the Clemson Cooperative Extension Service (CES) initiated a two-year project that promises to implement bacteria runoff control measures in critical areas throughout the watersheds. If successful, this implementation project will result in improved water quality and consistent attainment of water quality standards for fecal coliform bacteria. An approximate 50% reduction is needed in the Coneross Creek watershed to meet fecal coliform standards.

To achieve this goal, the project sponsor will implement a combination of BMPs on a watershed scale that include detailed waste and grazing management procedures, engineered BMPs focusing on riparian zones, septic system upgrades including constructed wetlands, and an extensive educational campaign targeted towards homeowners. Clemson CES has recruited a number of partners in this effort including the USDA/NRCS, Oconee County Soil and Water Conservation District, Oconee County Beef Cattlemen's Association, and the SCDHEC Oconee County Health Department. The Beaverdam Creek/Coneross Creek TMDL Project, using the diverse expertise available in this partnership, should result in demonstrable improvement to water quality in these watersheds.

03060101-090

(Eighteenmile Creek/Lake Hartwell)

General Description

Watershed 03060101-090 is located in Pickens and Anderson Counties and consists primarily of ***Eighteenmile Creek*** and its tributaries, which form an arm of ***Lake Hartwell***. The watershed occupies 38,085 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Cecil-Hiwassee series. The erodibility of the soil (K) averages 0.26, and the slope of the terrain averages 9% with a range of 2-25%. Land use/land cover in the watershed includes: 68.2% forested land, 15.6% agricultural land, 13.9% urban land, 1.1% forested wetland, 0.7% water, and 0.5% barren land.

Eighteenmile Creek originates near the City of Easley and accepts drainage from Woodside Branch and Fifteenmile Creek, before forming an arm of Lake Hartwell. There are a total of 58.5 stream miles and 284.7 acres of lake waters in this watershed, all classified FW.

Surface Water Quality

Station #	Type	Class	Description
SV-017	S	FW	Eighteenmile Creek at unnumbered county rd, 2.25 mi SSW of Easley
SV-241	S	FW	Woodside Branch at US 123, 1.5 mi E of Liberty
SV-245	S	FW	Eighteenmile Creek at S-39-27, 3.3 mi S of Liberty
SV-135	P/BIO	FW	Eighteenmile Creek at S-39-93, S of Central
SV-268	P	FW	Eighteenmile Creek at 2-04-1098

Eighteenmile Creek - There are four monitoring sites along Eighteenmile Creek. Aquatic life uses are fully supported at the upstream site ***(SV-017)***. A significant increasing trend in dissolved oxygen concentration and significant decreasing trend in five-day biochemical oxygen demand suggest improving conditions for these parameters. Recreational uses are not supported at this site due to fecal coliform bacteria excursions.

Aquatic life uses are also fully supported at the next site downstream ***(SV-245)***. A significant increasing trend in dissolved oxygen concentration and significant decreasing trends in five-day biochemical oxygen demand and turbidity suggest improving conditions for these parameters. Recreational uses are not supported at this site due to fecal coliform bacteria excursions.

Further downstream ***(SV-135)***, aquatic life uses are fully supported based on macroinvertebrate community data. A significant increasing trend in dissolved oxygen concentration and significant decreasing trend in five-day biochemical oxygen demand suggest improving conditions for these parameters. Recreational uses are not supported at this site due to fecal coliform bacteria excursions. In addition, there is a significant increasing trend in fecal coliform bacteria concentration.

At the furthest downstream site ***(SV-268),*** aquatic life uses are not supported due to excursions in pH, total phosphorus, and chlorophyll-*a*. There are also significant increasing trends in five-day biochemical oxygen demand and pH. A significant increasing trend in dissolved oxygen concentration and significant decreasing trend in turbidity suggest improving conditions for these parameters. In sediments, a high concentration of zinc was detected in the 1996 sample. Recreational uses are partially supported at this site due to fecal coliform bacteria excursions; however, a significant decreasing trend in fecal coliform bacteria concentration suggests improving conditions for this parameter.

Woodside Branch (SV-241) - Aquatic life uses are fully supported. There is a significant decreasing trend in pH. A significant increasing trend in dissolved oxygen concentration and significant decreasing trends in five-day biochemical oxygen demand and turbidity suggest improving conditions for these parameters. Recreational uses are partially supported and a significant decreasing trend in fecal coliform bacteria concentration suggests improving conditions for this parameter.

A fish consumption advisory has been issued by the Department for PCBs (Polychlorinated biphenols) and includes the impounded area (Lake Hartwell) of Eighteenmile Creek within this watershed (see advisory p.37).

NPDES Program

Active NPDES Facilities

RECEIVING STREAM FACILITY NAME PERMITTED FLOW @ PIPE (MGD)	NPDES# TYPE COMMENT
EIGHTEENMILE CREEK MILLIKEN & CO./PENDLETON FINISHING PIPE #: 001 FLOW: M/R	SC0000477 MAJOR INDUSTRIAL
EIGHTEENMILE CREEK TOWN OF PENDLETON-CLEMSON REG. WWTP PIPE #: 001 FLOW: 2.0	SC0035700 MAJOR DOMESTIC
EIGHTEENMILE CREEK PICKENS COUNTY/18MILE CK UPPER REG. WWTP PIPE #: 001 FLOW: 1.0	SC0042994 MAJOR DOMESTIC
EIGHTEENMILE CREEK PICKENS COUNTY/18MILE CK MIDDLE REG. WWTP PIPE #: 001 FLOW: 1.0	SC0047856 MAJOR DOMESTIC
EIGHTEENMILE CREEK TRIBUTARY HEATHERWOOD SD/MADERA UTIL. PIPE #: 001 FLOW: 0.072	SC0029548 MINOR DOMESTIC
EIGHTEENMILE CREEK TRIBUTARY MCKECHNIE PLASTIC COMPONENTS PIPE #: 001 FLOW: M/R	SCG250077 MINOR INDUSTRIAL
WOODSIDE BRANCH LIBERTY DENIM LLC PIPE #: 001 FLOW: M/R	SC0000264 MAJOR INDUSTRIAL

Nonpoint Source Management Program

Land Disposal Activities

Landfill Facilities

LANDFILL NAME ***FACILITY TYPE***	***PERMIT #*** ***STATUS***
TOWN OF PENDLETON MSW LANDFILL DOMESTIC	041001-1103 CLOSED
ANDERSON COUNTY LANDFILL DOMESTIC	DWP-048; DWP-115 CLOSED
ANDERSON COUNTY LANDFILL DOMESTIC	042401-6001 ACTIVE
TOWN OF PICKENS CENTRAL LANDFILL DOMESTIC	391001-1102; DWP-057 CLOSED
CITY OF CLEMSON BRUSH RECYCLING DOMESTIC	DWP-018 CLOSED
CLEMSON UNIVERSITY LANDFILL INDUSTRIAL	IWP-129 (SCD980079420) CLOSED
CLEMSON SLUDGE FARM INDUSTRIAL	IWP-206 CLOSED
WACCAMAW LANE LAND CLEARING LANDFILL C & D	392603-1701 INACTIVE
EASLEY BUILDERS SUPPLY LANDFILL C & D	392639-1701 INACTIVE

Mining Activities

MINING COMPANY ***MINE NAME***	***PERMIT #*** ***MINERAL***
PICKENS COUNTY LIBERTY BORROW SITE	1351-77 CLAY

Growth Potential

There is a moderate to high potential for growth in this watershed, which contains portions of the Cities of Easley and Clemson and the Towns of Liberty, Norris, Central, and Pendleton. A residential growth trend extends eastward from Clemson to Central, Liberty, and Easley along S.C. Hwy 93 and U.S. Hwy 123. Commercial growth is predicted between Easley and Pickens along S.C. Hwy 8. The City of Easley has the greatest potential for commercial growth due to its proximity to S.C. 93, 153, and 8 and U.S. 123.

Industrial growth in this watershed is due, in part, to the established infrastructure and transportation system, and the proximity to I-85. The topography of Easley is most conducive to industrial development and gives it the highest potential for growth in this area. The Town of Liberty also has a high potential for industrial growth due to the large tracts in the Liberty vicinity that are projected to develop, pending the construction of new or expanded sewage disposal plants in the area. Construction of these will encourage growth along the U.S. 123 corridor as well. The Town of Pendleton is also projected for industrial growth along the U.S. Hwy 76 corridor from Pendleton to Anderson. In addition, a rail line runs through Pendleton to Seneca, a criterion for siting a new industry.

03060101-100

(Three and Twenty Creek/Lake Hartwell)

General Description

Watershed 03060101-100 is located in Pickens and Anderson Counties and consists primarily of ***Three and Twenty Creek*** and its tributaries, which form an arm of ***Lake Hartwell***. The watershed occupies 58,972 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Cecil-Hiwassee series. The erodibility of the soil (K) averages 0.26, and the slope of the terrain averages 10% with a range of 2-25%. Land use/land cover in the watershed includes: 51.5% forested land, 41.0% agricultural land, 4.9% urban land, 1.4% water, 0.7% forested wetland, and 0.5% barren land.

Three and Twenty Creek originates near the City of Easley and accepts drainage from Charles Creek, Carmel Creek, Pickens Creek, and Double Branch. Further downstream, Cuffie Creek enters Three and Twenty Creek followed by Big Garvin Creek (Bishop Branch, Little Garvin Creek), Town Creek, and Millwee Creek. There are a total of 96.0 stream miles and 872.5 acres of lake waters in this watershed, all classified FW.

Surface Water Quality

Station #	Type	Class	Description
SV-735	BIO	FW	THREE AND TWENTY CREEK AT S-04-280
SV-111	S	FW	THREE AND TWENTY CREEK AT S-04-29

Three and Twenty Creek* -** There are two monitoring sites along Three and Twenty Creek. At the upstream site ***(SV-735), aquatic life uses are fully supported based on macroinvertebrate community data. At the downstream site ***(SV-111),*** aquatic life uses are fully supported. A significant increasing trend in dissolved oxygen concentration and significant decreasing trend in five-day biochemical oxygen demand suggest improving conditions for these parameters. Recreational uses are not supported at this site due to fecal coliform bacteria excursions. In addition, there is a significant increasing trend in fecal coliform bacteria concentration.

A fish consumption advisory has been issued by the Department for PCBs (Polychlorinated biphenols) and includes the impounded area (Lake Hartwell) of Three and Twenty Creek within this watershed (see advisory p.37).

NPDES Program

Active NPDES Facilities

RECEIVING STREAM	***NPDES#***
FACILITY NAME	***TYPE***
PERMITTED FLOW @ PIPE (MGD)	***COMMENT***
THREE AND TWENTY CREEK	SC0000485
MT.VERNON MILLS/LAFRANCE	MAJOR INDUSTRIAL
PIPE #: 001 FLOW: TIER I = 0.1	
PIPE #: 001 FLOW: TIER II = 0.5	
PIPE #: 002 FLOW: M/R	
THREE AND TWENTY CREEK	SC0026701
MICHELIN N AMERICA/SANDY SPRINGS	MAJOR INDUSTRIAL
PIPE #: 001 FLOW: M/R	

Nonpoint Source Management Program

Land Disposal Activities

Landfill Facilities

LANDFILL NAME	***PERMIT #***
FACILITY TYPE	***STATUS***
GERBER CHILDRENSWEAR LANDFILL	232408-1301
INDUSTRIAL	INACTIVE
MARTIN GRADING & SAND CO.	392900-1303
C & D	INACTIVE
MARTIN GRADING LAND C&D LANDFILL	392600-1702
C & D	ACTIVE

Growth Potential

There is a moderate potential for growth in this watershed, which contains portions of the Towns of Pendleton and La France. The area between the City of Anderson and Pendleton, including the Town of La France, along U.S. Hwy 76, is predicted to grow significantly. In addition, a rail line, an encouragement for growth, runs through LaFrance and Pendleton to Seneca.

Upper Savannah River Basin Description

The Upper Savannah River Basin encompasses 7 watersheds and 1,164 square miles. The Upper Savannah River Basin is predominately within the Piedmont geographical region. Of the 744,798 acres, 65.4% is forested land, 21.9% is agricultural land, 5.3% is water, 3.7% is urban land, 3.2% is barren land, and 0.5% is forested wetland (swamp). The urban land percentage is comprised chiefly of the City of Anderson, and to a lesser extent the Cities of Abbeville and Greenwood. There are approximately 1,341 stream miles and 43,677 acres of lake waters in this basin. All streams described below are on the South Carolina side of the Savannah River.

The Savannah River flows out of the Hartwell Dam and into Lake Russell, where it accepts drainage from the Rocky River (Lake Secession, Wilson Creek). The Savannah River then flows out of the Richard B. Russell Dam and into Lake J. Strom Thurmond, where it accepts drainage from the Little River and Long Cane Creek.

Physiographic Regions

The State of South Carolina has been divided into six Major Land Resource Areas (MLRAs) by the USDA Soil Conservation Service. The MLRAs are physiographic regions that have soils, climate, water resources, and land uses in common. The physiographic region that defines the Upper Savannah River Basin is as follows:

The **Piedmont** is an area of gently rolling to hilly slopes with narrow stream valleys dominated by forests, farms, and orchards; elevations range from 375 to 1,000 feet.

Land Use/Land Cover

General land use/land cover mapping for South Carolina was derived from the U.S. Geological Survey's National Land Cover Data (NLCD), based on nationwide Landsat Thematic Mapper (TM) multispectral satellite images (furnished through the Multi-Resolution Land Characteristics (MRLC) consortium, coordinated by USEPA) using image analysis software to inventory the Nation's land classes. The NLCD are developed by the USGS (EROS Data Center) using TM image interpretation, air photo interpretation, National Wetland Inventory data analysis, and ancillary data analysis.

Urban land is characterized by man-made structures and artificial surfaces related to industrial, commercial, and residential uses, and vegetated portions of urban areas such as recreational grass lands and industrial facility lawns.

Agricultural/Grass land is characterized by row crops, pastures, orchards, vineyards, and hay land, and includes grass cover in fallow, scrub/shrub, forest clearcut and urban areas.

Forest land is characterized by deciduous and evergreen trees (or a mix of these), not including forests in wetland settings, generally greater than 6 meters (approximately 20 feet) in height, with tree canopy of 25-100% cover.

Forested Wetland is saturated bottomland, mostly hardwood, forests primarily composed of wooded swamps occupying river floodplains, moist marginal forests, and isolated low-lying wet areas, located predominantly in the Coastal Plain.

Nonforested Wetland is saturated marshland, most commonly located in coastal tidelands and in isolated freshwater inland areas, found predominantly in the Coastal Plain.

Barren land is characterized by a nonvegetated condition of the land, both natural (rock, beaches, nonvegetated flats) and man-induced (rock quarries, mines, and areas cleared for construction in urban areas or clearcut forest areas).

Water (non-land) includes both fresh (inland) and saline (tidal) waters.

Soil Types

The dominant soil associations, or those soil series comprising, together, over 40% of the land area, were recorded for each watershed in percent descending order. The individual soil series for the Upper Savannah River Basin are described as follows.

Cataula soils are deep, gently sloping to strongly sloping, well drained soils with a loamy surface layer and a clayey subsoil.

Cecil soils are deep, well drained, gently sloping to sloping soils that have red subsoil.

Davidson soils are deep, gently sloping to strongly sloping, well drained to somewhat poorly drained soils with a loamy surface layer and a clayey subsoil.

Goldston soils are dominantly sloping to steep, well drained to excessively drained soils.

Hiwassee soils are well drained, moderately sloping soils with clayey subsoil, moderately deep.

Madison soils are well drained, moderately sloping soils, with clayey subsoil, moderately deep.

Pacolet soils are well drained, moderately steep soils with clayey subsoil, moderately deep.

Wilkes soils are dominantly strongly sloping to steep, well drained soils.

Slope and Erodibility

The definition of soil erodibility differs from that of soil erosion. Soil erosion may be more influenced by slope, rainstorm characteristics, cover, and land management than by soil properties. Soil erodibility refers to the properties of the soil itself, which cause it to erode more or less easily than others when all other factors are constant.

The soil erodibility factor, K, is the rate of soil loss per erosion index unit as measured on a unit plot, and represents an average value for a given soil reflecting the combined effects of all the soil properties that significantly influence the ease of soil erosion by rainfall and runoff if not protected. The K values closer to 1.0 represent higher soil erodibility and a greater need for best management practices to minimize erosion and contain those sediments that do erode. The range of K-factor values in the Upper Savannah River Basin is from 0.26 to 0.30.

Fish Consumption Advisory

At the time of publication, a fish consumption advisory issued by SCDHEC is in effect for Lake Hartwell and Lake Russell advising people to limit the amount of some types of fish consumed from these waters. Fish consumption advisories are updated annually in March. For background information and the most current advisories please visit the Bureau of Water homepage at http://www.scdhec.gov/water and click on "Advisories". For more information or a hard copy of the advisories, call SCDHEC's Division of Health Hazard Evaluation toll-free at (888) 849-7241.

Climate

Normal yearly rainfall in the Upper Savannah River area during the period of 1971 to 2000 was 48.01 inches, according to South Carolina's 30-year climatological record. Data from National Weather Service stations in Anderson, Anderson County Airport, West Pelzer, Calhoun Falls, Greenwood, Edgefield, McCormick, Belton, Antreville, and Johnston were compiled to determine general climatic information for the Upper Savannah River area. The highest seasonal rainfall occurred in the winter with 13.14 inches; 12.15, 11.96, and 10.76 inches of rain fell in the spring, summer, and fall, respectively. The average annual daily temperature was 60.1^{o}F. Winter temperatures averaged 43.1 ^{o}F, and spring, summer, and fall mean temperatures were 60.0 ^{o}F, 75.6 ^{o}F, and 61.6 ^{o}F, respectively.

Watershed Evaluations

03060103-020
(Savannah River/Lake Hartwell)

General Description

Watershed 03060103-020 is located in Anderson County and consists primarily of the ***Savannah River*** as it flows through ***Lake Hartwell***. This watershed occupies 8,784 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Cecil-Madison-Pacolet series. The erodibility of the soil (K) averages 0.26, and the slope of the terrain averages 12%, with a range of 2-40%. Land use/land cover in the watershed includes: 56.8% water, 24.7% forested land, 15.6% agricultural land, 1.4% urban land, 1.2% forested wetland, 0.2% nonforested wetland, and 0.1% barren land.

This uppermost reach of the Savannah River forms the lower end of Lake Hartwell. Lightwood Log Creek flows into the river on the Georgia side. There are no stream miles in this watershed, but 5,266.6 acres of lake waters within the South Carolina portion of the watershed, all classified FW.

Surface Water Quality

Station #	Type	Class	Description
SV-340	P	FW	LAKE HARTWELL, MAIN BODY AT USACE WQ BUOY BETWEEN MARKERS 11 & 12

Lake Hartwell (SV-340) - Aquatic life uses are fully supported. There is a significant increasing trend in pH. Significant decreasing trends in five-day biochemical oxygen demand and turbidity suggest improving conditions for these parameters. Recreational uses are fully supported and a significant decreasing trend in fecal coliform bacteria concentration suggests improving conditions for this parameter.

A fish consumption advisory has been issued by the Department for PCBs (Polychlorinated biphenols) and includes Lake Hartwell within this watershed (see advisory p.83).

Nonpoint Source Management Program
Land Disposal Activities
Land Application Sites

LAND APPLICATION SYSTEM *FACILITY NAME*	*ND#* *TYPE*
SPRAYFIELD HARTWELL VILLAS ASSOC., INC.	ND0067041 DOMESTIC
GOLF COURSE STONE CREEK COVE HOMEOWNERS ASSOC.	ND0067032 DOMESTIC

Growth Potential

There is a low potential for growth in this watershed.

03060103-030

(Savannah River/ Lake Russell)

General Description

Watershed 03060103-030 is located in Anderson and Abbeville Counties and consists primarily of the ***Savannah River*** and its tributaries from the Hartwell Dam to the Richard B. Russell Dam, forming ***Lake Richard B. Russell***. The watershed occupies 107,778 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Cecil-Hiwassee-Davidson series. The erodibility of the soil (K) averages 0.26, and the slope of the terrain averages 10%, with a range of 2-15%. Land use/land cover in the watershed includes: 54.9% forested land, 27.9% agricultural land, 7.3% urban land, 6.3% water, 2.9% barren land, and 0.7% forested wetland.

The Savannah River flows out of the Hartwell Dam and flows into and through Lake Richard B. Russell. Streams flowing into the river from the Georgia side are connoted with an asterisk. Whitner Creek and Dye Creek merge to form Big Generostee Creek. After the confluence, Big Generostee Creek accepts drainage from Threemile Creek, Fivemile Creek, Richland Creek, Mountain Creek, Devil Fork Creek (Reedy Creek), Buckingham Creek, and Weems Creek. Downstream of Big Generostee Creek, the river accepts drainage from Cedar Creek* and Little Generostee Creek (East Prong, Canoe Creek, Crooked Creek). Pickens Creek* and Band Creek flow into the headwaters of Lake Russell, followed by Coldwater Creek*, Allen Creek (Bowman Branch, Deal Creek), Van Creek*, the Rocky River watershed, Beaverdam Creek*, Calhoun Branch, and Beer Garden Creek (Manor Creek). There are a total of 195.6 stream miles and 8,643.9 acres of lake waters within the South Carolina portion of the watershed, all classified FW.

Surface Water Quality

Station #	Type	Class	Description
SV-100	P	FW	LAKE RUSSELL AT SC 181, 6.5 MI SW OF STARR
SV-316	S	FW	BIG GENEROSTEE CREEK AT CO. ROAD 104
SV-101	BIO	FW	BIG GENEROSTEE CREEK AT SC 187
SV-109	BIO	FW	LITTLE GENEROSTEE CREEK AT SC 184
SV-098	P	FW	LAKE RUSSELL AT SC 72, 3.1 MI SW CALHOUN FALLS

Lake Russell – There are two monitoring sites along the main stem of Lake Russell. At the uplake site ***(SV-100),*** aquatic life uses are fully supported; however, there is a significant decreasing trend in dissolved oxygen concentration. Significant decreasing trends in five-day biochemical oxygen demand, turbidity, and total nitrogen concentration suggest improving conditions for these parameters. Recreational uses are fully supported at this site and a significant decreasing trend in fecal coliform bacteria concentration suggests improving conditions for this parameter.

At the downlake site ***(SV-098),*** aquatic life uses are fully supported; however, there is a significant increasing trend in total phosphorus concentration. There is also a significant increasing trend in pH. Significant decreasing trends in five-day biochemical oxygen demand, turbidity, and total nitrogen concentration suggest improving conditions for these parameters. Recreational uses are fully supported at this site and a significant decreasing trend in fecal coliform bacteria concentration suggests improving conditions for this parameter.

Big Generostee Creek **–** There are two monitoring sites along Big Generostee Creek. At the upstream site ***(SV-316),*** aquatic life uses are fully supported. A significant increasing trend in dissolved oxygen concentration and significant decreasing trends in five-day biochemical oxygen demand and turbidity suggest improving conditions for these parameters. Recreational uses are not supported at this site due to fecal coliform bacteria excursions. In addition, there is a significant increasing trend in fecal coliform bacteria concentration. At the downstream site ***(SV-101)*** aquatic life uses are partially supported based on macroinvertebrate community data.

Little Generostee Creek (SV-109) **–** Aquatic life uses are fully supported based on macroinvertebrate community data.

A fish consumption advisory has been issued by the Department for mercury and includes Lake Russell within this watershed *(see advisory p. 83).*

Groundwater Quality

Well #	Class	Aquifer	Location
AMB-055	GB	SAPROLITE	STARR
AMB-076	GB	PIEDMONT BEDROCK	STARR

All water samples collected from ambient monitoring wells ***AMB-055*** and ***AMB-076*** met standards for Class GB groundwater.

NPDES Program

Active NPDES Facilities

RECEIVING STREAM ***FACILITY NAME*** ***PERMITTED FLOW @ PIPE (MGD)***	***NPDES#*** ***TYPE*** ***COMMENT***
BIG GENEROSTEE CREEK CITY OF ANDERSON/GENEROSTEE CREEK PIPE #: 001 FLOW: 9.5	SC0023752 MAJOR DOMESTIC
BIG GENEROSTEE CREEK HONEYWELL NYLON, INC./ANDERSON PIPE #: 001 FLOW: M/R	SC0000281 MAJOR INDUSTRIAL
EAST PRONG TOWN OF IVA/WESTSIDE WWTP B PIPE #: 001 FLOW: 0.378	SC0025828 MINOR DOMESTIC
RICHLAND CREEK HONEYWELL NYLON, INC./ANDERSON PIPE #: 002 FLOW: M/R PIPE #: 003 FLOW: M/R	SC0000281 MAJOR INDUSTRIAL

DYE CREEK RYOBI MOTOR PRODUCTS/ANDERSON PIPE #: 001 FLOW: 0.043	SCG250017 MINOR INDUSTRIAL
MOUNTAIN CREEK UNITED UTILITIES/CHAMBERT FOREST SD PIPE #: 001 FLOW: M/R PIPE #: 002 FLOW: M/R	SC0024716 MINOR DOMESTIC
LAKE RUSSELL SCPSA/JOHN RAINEY GEN. STA. PIPE #: 001 FLOW: M/R	SC0048135 MAJOR INDUSTRIAL

Nonpoint Source Management Program

Land Disposal Activities

Landfill Facilities

LANDFILL NAME ***FACILITY TYPE***	***PERMIT #*** ***STATUS***
STARR C& D AND LCD LANDFILL C & D	041001-1201; DWP-101; DWP-033 ACTIVE
STARR LANDFILL – ANDERSON CO. DOMESTIC	041001-1101 INACTIVE

Growth Potential

There is a moderate to high potential for growth in this watershed, which contains portions of the City of Anderson and the Towns of Starr, Iva, Homeland Park, and Calhoun Falls. Anderson is currently one of the largest manufacturing areas in the upstate region. Growth of the manufacturing industry is dependent on infrastructural expansion, which is dependent on the capacity of existing facilities. Many wastewater treatment facilities have expanded and are able to support future growth.

Projected industrial development in this watershed runs along the U.S. Hwy 76 corridor from Anderson to Pendleton, along the S.C. Hwy 81 corridor from Anderson to Starr, and along the western side of Anderson on S.C. Hwy 28. Also a rail line runs between Iva and Starr to Anderson, a criterion for siting new industry. A relatively high growth area lies between the Towns of Lowndesville and Antreville and will be impacted along S.C. 81 by the development in Calhoun Falls, located near the Lake Russell Dam. Calhoun Falls has upgraded their treatment system, replacing the lagoon treatment system, and are better able to support future growth.

03060103-070

(Rocky River/Lake Secession/Lake Russell)

General Description

Watershed 03060103-070 is located in Anderson and Abbeville Counties and consists primarily of the ***Rocky River*** and its tributaries as it flows through ***Lake Secession*** and into ***Lake Richard B. Russell***. The watershed occupies 153,371 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Cecil-Hiwassee-Davidson series. The erodibility of the soil (K) averages 0.26, and the slope of the terrain averages 10%, with a range of 2-15%. Land use/land cover in the watershed includes: 57.3% forested land, 28.4% agricultural land, 7.3% urban land, 4.1% water, 2.2% barren land, and 0.7% forested wetland.

Beaverdam Creek (Anderson Reservoir) and Little Beaverdam Creek join to form the Rocky River. Downstream from the confluence, the river accepts drainage from Cox Creek (Bailey Creek) and Broadway Creek. Watermelon Creek (Rock Creek) and Browns Creek join to form Broadway Creek, which accepts drainage from Cupboard Creek, Pea Creek, Neals Creek, and Broadway Lake before discharging into the Rocky River. Beaver Creek (Betsy Creek, Nesbit Creek, Tugaloo Creek) enters the river next, followed by Hencoop Creek (Cherokee Creek, Long Branch), Bear Creek, and Governors Creek. The Rocky River then impounds into Lake Secession and accepts drainage from First Creek. Downstream of the Lake Secession Dam, the Rocky River accepts drainage from the Wilson Creek Watershed, Long Branch, and Charlies Creek before draining into Lake Russell. There are a total of 263.3 stream miles and 7,934.1 acres of lake waters within the South Carolina portion of the watershed, all classified FW.

Surface Water Quality

Station #	Type	Class	Description
SV-031	P	FW	ROCKY RIVER AT S-04-263, 2.7 MI SE ANDERSON AT STP
SV-041	S	FW	ROCKY RIVER AT S-04-152 BELOW ROCKY RIVER STP
SV-139	S	FW	CUPBOARD CK AT S-04-733ABOVE BREAZEALE ST PLT & BELOW BLAIR HILL
SV-140	S	FW	CUPBOARD CK AT S-04-209 BELOW EFFLUENT FROM BELTON 2 PLANT
SV-141	S/BIO	FW	BROADWAY CREEK AT US 76 BETWEEN ANDERSON & BELTON
SV-319	W	FW	BROADWAY LAKE, BROADWAY CREEK ARM UPSTREAM OF PUBLIC ACCESS
SV-258	W	FW	BROADWAY LAKE, NEALS CREEK ARM ½ BETWEEN BANKS AT GOLF COURSE
SV-321	W	FW	BROADWAY LAKE FOREBAY, ½ BETWEEN SPILLWAY AND OPPOSITE LAND
SV-346	W	FW	ROCKY RIVER AT S-04-244
SV-037	S	FW	BETSY CREEK AT S-04-259 BELOW FIBERGLAS OUTFALL
SV-650	BIO	FW	ROCKY RIVER AT SC 413
SV-043	S	FW	CHEROKEE CREEK AT S-04-318, 4 MI S OF BELTON
SV-044	BIO	FW	HENCOOP CREEK AT S-04-244
SV-331	P	FW	LAKE SECESSION, 1¼ MI BELOW SC 28
SV-332	P	FW	LAKE SECESSION APPROX. 400 YDS ABOVE DAM
SV-357	W	FW	LAKE RUSSELL, ROCKY RIVER ARM BETWEEN MARKERS 48 & 49

Cupboard Creek – There are two stations along Cupboard Creek. Aquatic life uses are not supported at the upstream site ***(SV-139)*** due to dissolved oxygen excursions. There is also a significant decreasing trend in pH and a significant increasing trend in turbidity. A significant decreasing trend in five-day biochemical oxygen demand suggests improving conditions for this parameter. Recreational uses are not supported at this site due to fecal coliform bacteria excursions.

At the downstream site ***(SV-140),*** aquatic life uses are fully supported; however, there is a significant increasing trend in turbidity. There is a significant decreasing trend in pH. A significant increasing trend in dissolved oxygen concentration and significant decreasing trends in five-day biochemical oxygen demand and total phosphorus concentration suggest improving conditions for these parameters. Recreational uses are not supported due to fecal coliform bacteria excursions. In addition, there is a significant increasing trend in fecal coliform bacteria concentrations.

Broadway Creek (SV-141) – Aquatic life uses are partially supported based on macroinvertebrate community data. A significant decreasing trend in five-day biochemical oxygen demand suggests improving conditions for this parameter. Recreational uses are not supported due to fecal coliform bacteria excursions.

Broadway Lake – There are three monitoring sites on Lake Broadway and aquatic life and recreational uses are fully supported **at all three** sites (***SV-319, SV-258, SV-321***).

Betsy Creek (SV-037) – Aquatic life uses are not supported due to occurrences of copper in excess of the aquatic life acute criterion. There is also a significant decreasing trend in dissolved oxygen concentration. In sediments, diethyl phthalate, di-n-butyl phthalate, and PCB 1248 were detected in the 1996 sample. In the 1997 sediment sample P,P' DDE, a metabolite of DDT, and PCB 1248 and PCB 1260 were detected. PCB 1248 and PCB 1016 were detected in the 1998 sediment sample, and toluene, PCB 1242, and PCB 1254 were detected in the 1999 sample. Although the use of DDT was banned in 1973, and the manufacture and use of PCBs was banned in 1979, they are very resistant to degradation and therefore very persistent in the environment. Recreational uses are fully supported; however, there is a significant increasing trend in fecal coliform bacteria concentrations.

Cherokee Creek (SV-043) – Aquatic life uses are fully supported. There is a significant increasing trend in pH. A significant increasing trend in dissolved oxygen concentration and significant decreasing trends in five-day biochemical oxygen demand and turbidity suggest improving conditions for these parameters. Recreational uses are not supported due to fecal coliform bacteria excursions, compounded by a significant increasing trend in fecal coliform bacteria concentrations.

Hencoop Creek (SV-044) – Aquatic life uses are fully supported based on macroinvertebrate community data.

Rocky River – There are five monitoring sites along the Rocky River in this watershed. At the furthest upstream site ***(SV-031),*** aquatic life uses are fully supported; however, there is a significant increasing trend in turbidity. There is also a significant decreasing trend in pH. In sediment, di-n-butyl phthalate was detected in the 1996 sample and PCB 1242 was measured in the 1999 sample. Although the manufacture and use of PCBs was banned in 1979, they are very resistant to degradation and therefore very persistent in the environment. Recreational uses are not supported due to fecal coliform bacteria excursions, compounded by a significant increasing trend in fecal coliform bacteria concentrations.

Aquatic life uses are fully supported further downstream ***(SV-041***); however***,*** there is a significant increasing trend in total nitrogen concentration. A significant increasing trend in dissolved oxygen concentration and a significant decreasing trend in five-day biochemical oxygen demand suggest improving conditions for these parameters. In sediment, di-n-butyl phthalate was detected in the 1996 sample. Recreational uses are partially supported due to fecal coliform bacteria excursions, compounded by a significant increasing trend in fecal coliform bacteria concentrations.

At the next downstream site ***(SV-346),*** aquatic life uses are fully supported. In sediment, di-n-butyl phthalate was detected in the 1996 sample. Recreational uses are fully supported. Further downstream ***(SV-650),*** aquatic life uses are fully supported based on macroinvertebrate community data.

Aquatic life uses are fully supported at the Rocky River arm site of Lake Russell ***(SV-357)***. Although pH excursions occurred, due to the small sample size, aquatic life uses are considered to be fully supported. Recreational uses are fully supported at this site.

Lake Secession – There are two monitoring sites along Lake Secession. At the uplake site ***(SV-331),*** aquatic life uses are not supported due to total phosphorus and pH excursions. In addition, there is a significant increasing trend in pH. A significant decreasing trend in five-day biochemical oxygen demand suggests improving conditions for this parameter. In sediment, a high concentration of zinc was measured in the 1996 sample and di-n-butyl phthalate, and P,P'DDD and P,P' DDE, metabolites of DDT, were also detected. PCB 1248 was detected in the 1997 sediment sample and P,P' DDE was also detected in the 1997 and 1999 samples. Although the use of DDT was banned in 1973, and the manufacture and use of PCBs was banned in 1979, they are very resistant to degradation and therefore very persistent in the environment. Recreational uses are fully supported.

At the downlake site ***(SV-332),*** aquatic life uses are fully supported; however, there was a significant increasing trend in total phosphorus. There is also a significant increasing trend in pH. Significant decreasing trends in five-day biochemical oxygen demand and turbidity suggest improving conditions for these parameters. In sediment, high concentrations of chromium, copper, and zinc, and a very high concentration of lead, were measured in the 1996 sample. Di-n-butyl phthalate and P,P' DDE, a metabolite of DDT, were also detected in the 1996 sediment sample. Recreational uses are fully supported.

Natural Swimming Areas

FACILITY NAME ***RECEIVING STREAM***	***PERMIT #*** ***STATUS***
CALHOUN FALLS STATE PARK LAKE RUSSELL	01-N04 ACTIVE

NPDES Program

Active NPDES Facilities

RECEIVING STREAM ***FACILITY NAME*** ***PERMITTED FLOW @ PIPE (MGD)***	***NPDES#*** ***TYPE*** ***COMMENT***
BEAVER CREEK WELLINGTON YARNS INC. PIPE #: 001 FLOW: M/R	SCG250006 MINOR INDUSTRIAL
BEAVER CREEK FMR ELISKIM, INC. RCRA POSTCLOSURE PIPE #: 001 FLOW: M/R	SC0047210 MINOR INDUSTRIAL
BEAVER CREEK TRANSCONTINENTAL GAS PIPELINE PIPE #: 001 FLOW: M/R	SCG670006 MINOR INDUSTRIAL
BETSY CREEK OWENS-CORNING/ANDERSON PLT PIPE #: 001 FLOW: M/R	SC0000400 MAJOR INDUSTRIAL
NESBIT CREEK HANSON AGGREGATES SE/ANDERSON PIPE #: 001 FLOW: M/R	SCG730222 MINOR INDUSTRIAL
PEA CREEK VULCAN MATERIALS CO./TRIBBLE QUARRY PIPE #: 001 FLOW: M/R	SCG730112 MINOR INDUSTRIAL
ROCKY RIVER CITY OF ANDERSON/ROCKY RIVER PIPE #: 001 FLOW: 6.1	SC0023744 MAJOR DOMESTIC
LAKE RUSSELL MOHAWK INDUSTRIES/ROCKY RIVER PLT PIPE #: 001 FLOW: M/R	SC0000299 MAJOR INDUSTRIAL

Nonpoint Source Management Program

Land Disposal Activities

Landfill Facilities

LANDFILL NAME ***FACILITY TYPE***	***PERMIT #*** ***STATUS***
ANDERSON TIRE RECYCLING TIRE RECYCLING	042417-5201; 042417-5301 ACTIVE
OWENS-CORNING FIBERGLAS	043334-1601

INDUSTRIAL	ACTIVE
OWENS-CORNING FIBERGLAS INDUSTRIAL	IWP-036; IWP-015; IWP-240 INACTIVE
SHAW LCD & YARD TRASH LANDFILL LC & D	042698-1701; 042637-1701 ACTIVE
MILLER CONSTRUCTION SITE #5 C & D	042689-1702 ACTIVE
SOUTH ANDERSON C&D LANDFILL C & D	----------- PENDING
WHITE ST. SW TRANSFER FACILITY TRANSFER STATION	041001-6001 ACTIVE
ANDERSON COUNTY MATERIAL RECOVERY FAC. RECYLING CENTER	041001-2003 INACTIVE
ACE RECYCLING CENTER RECYLING CENTER	042663-2001 ACTIVE

Land Application Sites

LAND APPLICATION SYSTEM ***FACILITY NAME***	***ND#*** ***TYPE***
PERCOLATION LAGOON RIDGECREST SD	ND0067067 DOMESTIC

Mining Activities

MINING COMPANY ***MINE NAME***	***PERMIT #*** ***MINERAL***
VULCAN CONSTRUCTION CO. TRIBBLE QUARRY	0059-07 GRANITE
HANSON AGGREGATES SOUTHEAST INC. ANDERSON QUARRY	0424-07 GRANITE

Water Quantity

WATER USER ***STREAM***	***TOTAL PUMP. CAPACITY (MGD)*** ***RATED PUMP. CAPACITY (MGD)***
CITY OF ABBEVILLE LAKE RUSSELL	10.6 4.5
MOHAWK INDUSTRIES LAKE RUSSELL	4.3 1.44

Growth Potential

There is a moderate to high potential for growth in this watershed, which contains the Towns of Antreville, Lake secession, and Lowndesville; portions of the Towns of Calhoun Falls, and Homeland Park; and portions of the Cities of Anderson and Belton. Anderson is currently one of the largest manufacturing areas in the upstate region. Growth of the manufacturing industry is dependent on infrastructural expansion, which is dependent on the capacity of existing facilities. Many wastewater treatment facilities have expanded and are able to support future growth.

Projected industrial development in this watershed runs along the S.C. Hwy 81 corridor from Anderson to Starr, along the western side of Anderson on S.C. Hwy 28, and around the I-85 and S.C. Hwy 81 intersection. Also a rail line runs between Iva and Starr to Anderson, a criterion for siting new industry. Overall development trends are predicted to occur between Belton and Anderson along U.S. Hwy 76, and between Honea Path and Williamston (including Belton) along S.C. Hwy 20. Anderson County is in the process of developing long range plans for growth in this area.

A relatively high growth area lies between the Towns of Lowndesville and Antreville and will be impacted along S.C. 81 by the development in Calhoun Falls, located near the Lake Russell Dam. Calhoun Falls has upgraded their treatment system, replacing the lagoon treatment system, and are better able to support future growth.

03060103-080

(Wilson Creek)

General Description

Watershed 03060103-080 is located in Anderson and Abbeville Counties and consists primarily of ***Wilson Creek*** and its tributaries. The watershed occupies 24,703 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Cecil-Hiwassee series. The erodibility of the soil (K) averages 0.26, and the slope of the terrain averages 10%, with a range of 2-15%. Land use/land cover in the watershed includes: 58.3% forested land, 35.9% agricultural land, 3.1% urban land, 2.1% barren land, 0.3% forested wetland, and 0.3% water.

Wilson Creek accepts drainage from Jordan Creek (Deep Step Creek) and East Beards Creek before flowing into the Rocky River arm of Lake Russell. There are a total of 53.6 stream miles and 48.7 acres of lake waters in this watershed, all classified FW.

Surface Water Quality

Station #	**Type**	**Class**	**Description**
SV-185	BIO	FW	WILSON CREEK AT SC 413
SV-347	W	FW	WILSON CREEK AT S-04-294

Wilson Creek - There are two monitoring sites along Wilson Creek. Aquatic life uses are fully supported at the upstream site ***(SV-185)*** based on macroinvertebrate community data. Aquatic life uses are also fully supported at the downstream site ***(SV-347)***. Recreational uses are partially supported at this site due to fecal coliform bacteria excursions.

NPDES Program

Active NPDES Facilities

RECEIVING STREAM ***FACILITY NAME*** ***PERMITTED FLOW @ PIPE (MGD)***	***NPDES#*** ***TYPE*** ***COMMENT***
EAST BEARDS CREEK TOWN OF IVA/EASTSIDE FACILITY A PIPE #: 001 FLOW: 0.245	SC0025810 MINOR DOMESTIC

Growth Potential

There is a low to moderate potential for growth in this watershed, which contains portions of the Towns of Starr and Iva. Projected industrial development in this watershed runs along the S.C. Highway 81 corridor from Anderson to Starr. Also a rail line runs between Iva and Starr to Anderson, a criterion for siting new industry.

03060103-100

(Savannah River/Lake Thurmond)

General Description

Watershed 03060103-100 is located in Abbeville, McCormick, and Edgefield Counties and consists primarily of the ***Savannah River*** and its tributaries as it flows through ***Lake J. Strom Thurmond***. The watershed occupies 67,584 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Cataula-Wilkes-Goldston-Cecil series. The erodibility of the soil (K) averages 0.30, and the slope of the terrain averages 11%, with a range of 2-45%. Land use/land cover in the watershed includes: 65.7% forested land, 26.0% water, 3.8% barren land, 2.9% agricultural land, 0.8% forested wetland, and 0.8% urban land.

The Savannah River flows out of the Richard B. Russell Dam and into Lake Thurmond, where it accepts drainage from Coffer Creek and Russells Creek. The Broad River* and Pistol Creek* drain into the lake next from the Georgia side. All tributaries from the Georgia side of the Savannah River will be connoted with an asterisk. Further downstream, Patterson Creek enters the lake followed by Fishing Creek*, Lees Branch, Harmon Branch, Murray Creek*, another Patterson Creek, and Soap Creek*. The Little River watershed enters Lake Thurmond next, followed by Hawe Creek (Jester Branch), Wells Creek*, Benningsfield Creek, Landam Branch, Shriver Creek*, and Dordon Creek. At the lower end of the lake, Reese Branch flows into the lake followed by Howell Branch, Little River*, Lake Spring Creek*, and Scott Creek. There are a total of 55.1 stream miles and 18,450.6 acres of lake waters within the South Carolina portion of the watershed, all classified FW.

Surface Water Quality

Station #	Type	Class	Description
CL-040	W	FW	LAKE THURMOND HEADWATERS (SAVANNAH RIVER)
SV-291	P	FW	LAKE THURMOND AT US 378, 7 MI SW OF MCCORMICK
CL-041	W	FW	LAKE THURMOND IN FOREBAY NEAR DAM

Lake Thurmond – There are three stations along Lake Thurmond and **recreational uses** are fully supported **at all sites**. Although a pH excursion occurred at the headwaters site ***(CL-040),*** due to the small number of samples, aquatic life uses are considered to be fully supported. Aquatic life uses are also fully supported at the midlake site **(SV-291).** There is a significant decreasing trend in pH. Significant decreasing trends in five-day biochemical oxygen demand and total nitrogen concentration suggest improving conditions for these parameters. In sediments, a high concentration of chromium and very high concentrations of copper and nickel were measured in the 1997 sample. P,P'DDD, a metabolite of DDT, was also detected in the 1997 sediment sample. Although the use of DDT was banned in 1973, it is very persistent in the environment. Although a pH excursion occurred near the dam ***(CL-041),*** due to the small sample size, aquatic life uses are considered to be fully supported.

A fish consumption advisory has been issued by the Department for mercury and includes the Savannah River within this watershed (see advisory p.83).

Groundwater Quality

Well #	Class	Aquifer	Location
AMB-106	GB	PIEDMONT BEDROCK	HAMILTON BRANCH

All water samples collected from ambient monitoring well ***AMB-106*** met standards for Class GB groundwater.

NPDES Program

Active NPDES Facilities

RECEIVING STREAM ***FACILITY NAME*** ***PERMITTED FLOW @ PIPE (MGD)***	***NPDES#*** ***TYPE*** ***COMMENT***
LAKE THURMOND SCPRT/HAMILTON BRANCH PIPE #: 001 FLOW: M/R	SC0021466 MINOR DOMESTIC

Nonpoint Source Management Program

Land Disposal Activities

Landfill Facilities

LANDFILL NAME ***FACILITY TYPE***	***PERMIT #*** ***STATUS***
TOWN OF MCCORMICK C/C LANDFILL DOMESTIC	CWP-003; 331002-1201 INACTIVE
MCCORMICK COUNTY LANDFILL DOMESTIC	331002-1701 (SCD987584117) INACTIVE
BARITE HILL/NEVADA GOLD MINE INDUSTRIAL	332338-1601 (IWP-242) ---------

Growth Potential

There is a low potential for growth in this watershed, which contains portions of the Towns of Mount Carmel, McCormick, Plum Branch, Parksville, and Modoc. The Town of McCormick has experienced a population growth with the establishment of a State Prison near the town. Growth has occurred around the Savannah Lakes Village Development, a retirement village, on Lake Thurmond, and may encourage more in the future. The majority of the watershed resides within the Sumter National Forest and would tend to limit growth.

03060103-140

(Little River/Lake Thurmond)

General Description

Watershed 03060103-140 is located in Anderson, Abbeville, and McCormick Counties and consists primarily of ***Little River*** and its tributaries as it flows into ***Lake Thurmond***. The watershed occupies 236,683 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Cecil-Hiwassee series. The erodibility of the soil (K) averages 0.26, and the slope of the terrain averages 9%, with a range of 2-15%. Land use/land cover in the watershed includes: 71.2% forested land, 23.5% agricultural land, 2.6% barren land, 1.2% urban land, 1.1% water, and 0.4% forested wetland.

Barkers Creek (Blue Barker Creek, Long Branch) and Corner Creek join to form the Little River, which then accepts drainage from Camp Creek, Hogskin Creek (another Long Branch, Little Hogskin Creek), Chickasaw Creek, Spur Creek (Johnson Creek, Blacks Creek), Park Creek (Reids Creek), and Cochran Branch (Tanyard Branch). Penny Creek enters the river next, followed by Shanklin Creek, McKenley Creek (Morrow Creek, Baskin Branch, Gill Creek), and Sawney Creek (Sherard Lake). Calhoun Creek originates near the City of Abbeville and accepts drainage from Reid Creek, Redd Creek, Flagreed Creek, Jim Knox Branch, and White Creek (Hammond Branch, Bowie Branch, Calhoun Creek, Hillbern Creek, Hartzog Branch) before draining into the Little River. Further downstream, the river accepts drainage from Lott Creek, Lee Creek, Bell Creek, and Scott Creek. The river then begins to impound into the Little River arm of Lake Thurmond and accepts drainage from Connor Creek (Cole Branch), Wilson Spring Creek, Horse Branch, Ludlow Branch, Mill Creek, the Long Cane Creek watershed, Buffalo Creek (Vall Branch, Taylor Branch, Engevine Branch), and Baker Creek. There are a total of 485.3 stream miles and 2,673.2 acres of lake waters in the South Carolina portion of the watershed, all classified FW. The bottom third of the watershed is within the Sumter National Forest.

Surface Water Quality

Station #	Type	Class	Description
SV-164	W/BIO	FW	LITTLE RIVER AT S-01-24
SV-733	BIO	FW	HOGSKIN CREEK AT SC 184
SV-348	W/BIO	FW	LITTLE RIVER AT S-01-32
SV-644	BIO	FW	GILL CREEK AT S-01-32
SV-052	P	FW	SAWNEY CREEK AT CO. RD 1.5 MI SE OF CALHOUN FALLS
SV-171	BIO	FW	CALHOUN CREEK AT S-01-40
SV-192	W/BIO	FW	LITTLE RIVER AT S-01-19
CL-039	W	FW	LITTLE RIVER ARM OF LAKE THURMOND

Little River – There are four stations along the Little River. At the furthest upstream site ***(SV-164),*** aquatic life uses are fully supported based on macroinvertebrate community, physical, and chemical data. Recreational uses are partially supported at this site due to fecal coliform bacteria excursions. Further downstream ***(SV-348),*** aquatic life uses are also fully supported based on macroinvertebrate community, physical, and chemical data. Recreational uses are not supported at this site due to fecal coliform bacteria excursions.

Aquatic life uses are fully supported at the next site downstream ***(SV-192)*** based on macroinvertebrate community, physical, and chemical data. Recreational uses are partially supported at this site due to fecal coliform bacteria excursions. The site located on the Little River arm of Lake Thurmond ***(CL-039),*** is fully supported for aquatic life and recreational uses.

Hogskin Creek (SV-733)- Aquatic life uses are fully supported based on macroinvertebrate community data.

Gill Creek (SV-644)- Aquatic life uses are fully supported based on macroinvertebrate community data.

Sawney Creek (SV-052)- Aquatic life uses are partially supported due to dissolved oxygen excursions. In addition, there is a significant decreasing trend in dissolved oxygen concentration and a significant increasing trend in total nitrogen concentration. There is a significant decreasing trend in pH. A significant decreasing trend in turbidity suggests improving conditions for this parameter. Recreational uses are not supported due to fecal coliform bacteria excursions. This is compounded by a significant increasing trend in fecal coliform bacteria concentrations.

Calhoun Creek (SV-171) - Aquatic life uses are fully supported based on macroinvertebrate community data.

Natural Swimming Areas

FACILITY NAME ***RECEIVING STREAM***	***PERMIT #*** ***STATUS***
BAKER CREEK STATE PARK LITTLE RIVER ARM OF LAKE THURMOND	35-N01 ACTIVE

Groundwater Quality

Well #	Class	Aquifer	Location
AMB-054	GB	PIEDMONT BEDROCK	ABBEVILLE
AMB-075	GB	SAPROLITE	ABBEVILLE

All water samples collected from ambient monitoring wells ***AMB-054*** and ***AMB-075*** met standards for Class GB groundwater.

NPDES Program

Active NPDES Facilities

RECEIVING STREAM / ***FACILITY NAME*** / ***PERMITTED FLOW @ PIPE (MGD)***	***NPDES#*** / ***TYPE*** / ***COMMENT***
HILLBERN CREEK TRIBUTARY MILLIKEN & CO./SHARON PLT PIPE #: 001 FLOW: M/R	SC0023477 MINOR INDUSTRIAL
DAVIS BRANCH BIBB COMPANY/ABBEVILLE PLT PIPE #: 001 FLOW: M/R	SCG250020 MINOR INDUSTRIAL
SAWNEY CREEK TOWN OF CALHOUN FALLS PIPE #: 001 FLOW: 0.55 PIPE #: 001 FLOW: 1.50 (PROPOSED TIER) PIPE #: 001 FLOW: 3.00 (PROPOSED TIER)	SC0025721 MINOR DOMESTIC
PARK CREEK TOWN OF DUE WEST WWTP PIPE #: 001 FLOW: 0.3	SC0022403 MINOR DOMESTIC

Nonpoint Source Management Program

Land Disposal Activities

Landfill Facilities

LANDFILL NAME / ***FACILITY TYPE***	***PERMIT #*** / ***STATUS***
ABBEVILLE COUNTY LANDFILL DOMESTIC	DWP-110; 011001-1101; 011001-2001 INACTIVE DWP-915; 011002-1701
ABBEVILLE COUNTY LANDFILL DOMESTIC	011001-1102 ACTIVE
ABBEVILLE COUNTY LANDFILL #1 DOMESTIC	DWP-011 INACTIVE
ABBEVILLE COUNTY LANDFILL #2 DOMESTIC	DWP-062 INACTIVE
ABBEVILLE COUNTY LANDFILL INDUSTRIAL	--------- INACTIVE
TOWN OF CALHOUN FALLS DUMP DOMESTIC	-------- INACTIVE

Water Quantity

WATER USER / ***STREAM***		***TOTAL PUMP. CAPACITY (MGD)*** / ***RATED PUMP. CAPACITY (MGD)***
MCCORMICK CPW		2.8
LITTLE RIVER ARM OF LAKE THURMOND	2.7	

Growth Potential

There is a moderate potential for growth in this watershed, which contains the Towns of Willington and Due West, and portions of the Towns of Antreville, Calhoun Falls, Mount Carmel, and Honea Path. Industrial growth is projected along the U.S. Hwy 76 corridor from Honea Path to Belton at the top of the watershed. Overall development trends are predicted to occur between Honea Path and Williamston (including Belton) along S.C. Hwy 20.

A relatively high growth area lies between the Towns of Lowndesville and Antreville and will be impacted by the development in Calhoun Falls, which resides next to Sawney Creek. Calhoun Falls has upgraded their treatment system, replacing the lagoon treatment system, and are better able to support future growth. The Calhoun Falls Industrial Park is located in Calhoun Falls on S.C. Hwy 72 and serves as a source for future industrial growth. The City of Abbeville resides just over the eastern watershed border and affects both watersheds. Sharing the same rail line is the Abbeville County Industrial Park, located on the southwest side of the City of Abbeville, another source of potential industrial growth within the watershed. The Sumter National Forest extends across the lower third of the watershed and would limit growth in that area.

03060103-150

(Long Cane Creek)

General Description

Watershed 03060103-150 is located in Abbeville, Greenwood, and McCormick Counties and consists primarily of ***Long Cane Creek*** and its tributaries. The watershed occupies 145,895 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Cecil-Hiwassee series. The erodibility of the soil (K) averages 0.26, and the slope of the terrain averages 9%, with a range of 2-15%. Land use/land cover in the watershed includes: 75.7% forested land, 14.6% agricultural land, 2.9% urban land, 5.9% barren land, 0.6% water, and 0.3% forested wetland.

Long Cane Creek originates near the Town of Donalds, and accepts drainage from Miller Branch, Grays Creek, Pickens Creek, Bailey Creek (Bowie Branch, Morrison Branch, Job Creek), McCord Creek, Bagg Creek, and Johns Creek (Little Johns Creek, Long Branch, Dry Creek). Another McCord Creek (Keller Branch) enters Long Cane Creek next, followed by Norris Creek (Parker Creek, Adams Branch, Blue Hill Creek, Double Branch), and McGill Branch. Further downstream, Big Curltail Creek (Watts Branch, Little Curltail Creek, Grays Creek, Little Muckaway Creek, George Devlin Branch, Wharton Branch, Fell Branch) enters followed by Stillhouse Branch, Church Branch, Mountain Creek (Parsons Mountain Lake), Candy Branch, Big Branch (Richie Branch, Sawmill Creek), and Chapel Branch. Reedy Branch accepts drainage from South Fork (Hareb Branch) and Rocky Branch (Edwards Branch, Puckett Branch) before flowing into Long Cane Creek, followed by Flat Branch and Cow Branch. Long Cane Creek then begins to impound from the Little River arm of Lake Thurmond, and accepts drainage from Linkay Creek, Bold Branch (Persimmon Branch, Little Persimmon Branch, Rocky Branch, Tanyard Branch, Horton Branch, Morrah Branch, Welch Creek), and Mathias Creek. There are a total of 288.5 stream miles and 660.1 acres of lake waters in this watershed, all classified FW. The lower half of the watershed is contained within the Sumter National Forest.

Surface Water Quality

Station #	Type	Class	Description
SV-349	W/BIO	FW	LONG CANE CREEK AT S-01-159
SV-734	BIO	FW	JOHNS CREEK AT S-01-159
SV-053B	S	FW	BLUE HILL CREEK ON S MAIN ST ABBEVILLE
SV-054	BIO	FW	DOUBLE BRANCH AT S-01-33
SV-732	BIO	FW	BIG CURLY TAIL CREEK AT US FOREST RD 509
SV-318	W	FW	LONG CANE CREEK AT S-33-117, 7 MI NW MCCORMICK

Johns Creek (SV-734) - Aquatic life uses are partially supported based on macroinvertebrate community data.

Blue Hill Creek (SV-053B) - Aquatic life uses are not supported due to turbidity excursions. There is a significant decreasing trend in pH. A significant increasing trend in dissolved oxygen concentration suggests improving conditions for this parameter. Recreational uses are not supported due to fecal coliform bacteria excursions. In addition, there is a significant increasing trend in fecal coliform bacteria concentrations.

Double Branch (SV-054) - Aquatic life uses are partially supported based on macroinvertebrate community data.

Big Curly Tail Creek (SV-732) - Aquatic life uses are fully supported based on macroinvertebrate community data.

Long Cane Creek – There are two monitoring stations along Long Cane Creek. Aquatic life uses are fully supported at the upstream site ***(SV-349)*** based on macroinvertebrate community, physical, and chemical data. Recreational uses are not supported at this site due to fecal coliform bacteria excursions. At the downstream site ***(SV-318)*** aquatic life uses are fully supported. There is a significant decreasing trend in pH. A significant increasing trend in dissolved oxygen concentration and a significant decreasing trend in total nitrogen concentration suggest improving conditions for these parameters. Recreational uses are fully supported at this site and a significant decreasing trend in fecal coliform bacteria concentration suggests improving conditions for this parameter.

Natural Swimming Areas

FACILITY NAME ***RECEIVING STREAM***	***PERMIT #*** ***STATUS***
PARSONS MOUNTAIN PARSONS MOUNTAIN LAKE	01-1002N ACTIVE

NPDES Program

Active NPDES Facilities

RECEIVING STREAM ***FACILITY NAME*** ***PERMITTED FLOW @ PIPE (MGD)***	***NPDES#*** ***TYPE*** ***LIMITATION***
BLUE HILL CREEK MILLIKEN & CO./ABBEVILLE PLANT PIPE #: 001 FLOW: M/R	SC0000353 MAJOR INDUSTRIAL
LONG CANE CREEK CITY OF ABBEVILLE/LONG CANE CK WWTP PIPE #: 001 FLOW: 1.7	SC0040614 MAJOR DOMESTIC

Nonpoint Source Management Program

Land Disposal Activities

Landfill Facilities

LANDFILL NAME	***PERMIT #***

FACILITY TYPE	*STATUS*
CITY OF ABBEVILLE LANDFILL DOMESTIC	011002-1201; CWP-018 INACTIVE
CITY OF ABBEVILLE LANDFILL DOMESTIC	011002-1702 ACTIVE

Growth Potential

There is a moderate potential for growth in this watershed, which contains the Town of Abbeville, and portions of the Towns of Donalds, Hodges, Promised Land, Bradley, and Troy and a portion of the City of Greenwood. Industrial development in the Saluda River Basin may impact this watershed with a shared boundary. In particular, development within the Town of Hodges and the Sara Lee plant, together with the associated infrastructural and residential growth that runs along the U.S. Hwy 178 corridor to the City of Greenwood. The Abbeville County Industrial Park and the supporting rail line are sources of potential industrial growth in the watershed. The Greenwood County Industrial Site is also located within this watershed, and with support from another rail line, has potential for industrial growth. The Sumter National Forest extends across the lower half of the watershed and would limit growth in that area.

Lower Savannah River Basin Description

The ***Lower Savannah River Basin*** encompasses 15 watersheds, 2,123 square miles, and geographic regions that extend from the Piedmont to the Sandhills to the Upper and Lower Coastal Plains and on into the Coastal Zone. Of some 1.3 million acres, 61.0% is forested land, 12.5% is agricultural land, 12.3% is forested wetland (swamp), 9.84% is barren land, 2.1% is urban land, 1.3% is water, and 1.0% is nonforested wetland (marsh). Federal lands, such as the Savannah River Site and the Savannah National Wildlife Refuge, are a sizable portion of this basin. There are approximately 2,075 stream miles, 4,447 acres of lake waters, and 3,356 acres of estuarine areas in this basin.

The Savannah River flows out of the Thurmond Dam and is restricted again by the Stevens Creek dam, forming Stevens Creek Reservoir. Stevens Creek accepts drainage from Turkey Creek (Beaverdam Creek) and enters the Savannah River prior to the dam. Downstream of the Stevens Creek dam, the Savannah River accepts drainage from Horse Creek, Hollow Creek, Upper Three Runs, and Lower Three Runs (Par Pond). The Savannah River continues to flow between the States of South Carolina and Georgia until it reaches the City of Savannah, Georgia, where it drains into the Atlantic Ocean.

Physiographic Regions

The State of South Carolina has been divided into six Major Land Resource Areas (MLRAs) by the USDA Soil Conservation Service. The MLRAs are physiographic regions that have soils, climate, water resources, and land uses in common. The physiographic region that defines the Lower Savannah River Basin is as follows:

The **Piedmont** is an area of gently rolling to hilly slopes with narrow stream valleys dominated by forests, farms, and orchards; elevations range from 375 to 1,000 feet.

The **Sandhills** are an area of gently sloping to strongly sloping uplands with a predominance of sandy areas and scrub vegetation; elevations range from 250 to 450 feet.

The **Upper Coastal Plain** is an area of gentle slopes with increased dissection and moderate slopes in the northwestern section that contain the State's major farming areas; elevations range from 100 to 450 feet.

The **Lower Coastal Plain** is an area that is mostly nearly level and is dissected by many broad, shallow valleys with meandering stream channels; elevations range from 25 to 125 feet.

The **Coastal Zone** is a mostly tidally-influenced area that is nearly level and dissected by many broad, shallow valleys with meandering stream channels; most of the valleys terminate in tidal estuaries along the coast; elevations range from sea level to about 25 feet.

Land Use/Land Cover

General land use/land cover mapping for South Carolina was derived from the U.S. Geological Survey's National Land Cover Data (NLCD), based on nationwide Landsat Thematic Mapper (TM) multispectral satellite images (furnished through the Multi-Resolution Land Characteristics (MRLC) consortium, coordinated by USEPA) using image analysis software to inventory the Nation's land classes. The NLCD are developed by the USGS (EROS Data Center) using TM image interpretation, air photo interpretation, National Wetland Inventory data analysis, and ancillary data analysis.

Urban land is characterized by man-made structures and artificial surfaces related to industrial, commercial, and residential uses, and vegetated portions of urban areas such as recreational grass lands and industrial facility lawns.

Agricultural/Grass land is characterized by row crops, pastures, orchards, vineyards, and hay land, and includes grass cover in fallow, scrub/shrub, forest clearcut and urban areas.

Forest land is characterized by deciduous and evergreen trees (or a mix of these), not including forests in wetland settings, generally greater than 6 meters (approximately 20 feet) in height, with tree canopy of 25-100% cover.

Forested Wetland is saturated bottomland, mostly hardwood, forests primarily composed of wooded swamps occupying river floodplains, moist marginal forests, and isolated low-lying wet areas, located predominantly in the Coastal Plain.

Nonforested Wetland is saturated marshland, most commonly located in coastal tidelands and in isolated freshwater inland areas, found predominantly in the Coastal Plain.

Barren land is characterized by a nonvegetated condition of the land, both natural (rock, beaches, nonvegetated flats) and man-induced (rock quarries, mines, and areas cleared for construction in urban areas or clearcut forest areas).

Water (non-land) includes both fresh (inland) and saline (tidal) waters.

Soil Types

The dominant soil associations, or those soil series comprising, together, over 40% of the land area, were recorded for each watershed in percent descending order. The individual soil series for the Lower Savannah River Basin are described as follows.

Ailey soils are well drained loamy and sandy soils with clayey or loamy subsoil.

Argent soils are poorly drained soils on low, nearly level areas and low ridges.

Blanton soils are excessively drained soils that have loamy subsoil or are sandy throughout.

Bohicket soils are very poorly drained soils, clayey throughout or mucky and underlain with clayey layers, frequently flooded.

Cataula soils are deep, gently sloping to strongly sloping, well drained soils with a loamy surface layer and clayey subsoil.

Cecil soils are deep, well drained, gently sloping to sloping soils that have red subsoil.

Chastain soils are poorly drained to well drained soils that are clayey or loamy throughout and are subject to flooding.

Chewacla soils are nearly level, somewhat poorly drained and well drained soils.

Chisolm soils are deep, well to moderately drained soils with sandy to loamy subsoil on nearly level to gently sloping terrain.

Dothan soils are well drained, sandy soils with loamy subsoil.

Georgeville soils are gently sloping to sloping, well drained and moderately well drained soils.

Fuquay soils are well drained, loamy and sandy soils with clayey or loamy subsoil.

Goldsboro soils are moderately well to poorly drained soils with loamy subsoil on nearly level ridges and in shallow depressions.

Helena soils are gently sloping to sloping, moderately well drained to well drained soils.

Herndon soils are gently sloping to sloping, well drained and moderately well drained soils.

Lakeland soils are well drained to excessively drained, sandy soils with loamy subsoil.

Lynchburg soils are moderately well to poorly drained soils, with loamy subsoil, on nearly level ridges and in shallow depressions.

Norfolk soils are deep, well drained soils, with loamy subsoil, nearly level and gently sloping elevated uplands.

Ogeechee soils are poorly drained and moderately well drained, loamy soils with clayey or loamy subsoil, on terraces.

Rains soils are moderately well to poorly drained soils, with a loamy subsoil, on nearly level ridges and in shallow depressions.

Santee soils are very poorly drained soils on low nearly level areas.

Tatum soils are dominantly sloping to steep, well drained to excessively drained soils, with a loamy subsoil, moderately deep or shallow to weathered rock.

Tawcaw soils are poorly drained to well drained soils that are clayey or loamy throughout and are subject to flooding.

Troup soils are well drained, sandy soils with loamy subsoil and excessively drained soils.

Vaucluse soils are well drained, loamy and sandy soils with clayey or loamy subsoil.

Slope and Erodibility

The definition of soil erodibility differs from that of soil erosion. Soil erosion may be more influenced by slope, rainstorm characteristics, cover, and land management than by soil properties. Soil erodibility refers to the properties of the soil itself, which cause it to erode more or less easily than others when all other factors are constant.

The soil erodibility factor, K, is the rate of soil loss per erosion index unit as measured on a unit plot, and represents an average value for a given soil reflecting the combined effects of all the soil properties that significantly influence the ease of soil erosion by rainfall and runoff if not protected. The K values closer to 1.0 represent higher soil erodibility and a greater need for best management practices to minimize erosion and contain those sediments that do erode. The range of K-factor values in the Lower Savannah River Basin is from 0.12 to 0.35.

Fish Consumption Advisory

At the time of publication, a fish consumption advisory issued by SCDHEC is in effect for the Savannah River from the Thurmond Dam downstream to its discharge into the Atlantic Ocean advising people to limit the amount of some types of fish consumed from these waters. Fish consumption advisories are updated annually in March. For background information and the most current advisories please visit the Bureau of Water homepage at http://www.scdhec.gov/water and click on "Advisories". For more information or a hard copy of the advisories, call SCDHEC's Division of Health Hazard Evaluation toll-free at (888) 849-7241.

Climate

Normal yearly rainfall in the Lower Savannah River area during the period of 1971 to 2000 was 49.45 inches, according to South Carolina's 30-year climatological record. Data from National Weather Service stations in Aiken, Allendale, Hilton Head, Ridgeland, Blackville, and Clark Hill were compiled to determine general climatic information for the Lower Savannah River area. The highest seasonal rainfall occurred in the summer with 16.01 inches; 10.39, 11.97, and 11.09 inches of rain fell in the fall, winter, and spring, respectively. The average annual daily temperature was 64.2 ^{o}F. Summer temperatures averaged 79.5^{o}F, and fall, winter, and spring mean temperatures were 65.3 ^{o}F, 48.0 ^{o}F, and 63.7 ^{o}F, respectively.

Watershed Evaluations
03060106-030
(Savannah River /Stevens Creek Reservoir)

General Description

Watershed 03060106-030 is located in Edgefield and Aiken Counties and consists primarily of the ***Savannah River*** and its tributaries as it flows through ***Stevens Creek Reservoir***. The watershed occupies 13,648 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Fuquay-Troup-Cataula-Cecil- series. The erodibility of the soil (K) averages 0.20, and the slope of the terrain averages 7%, with a range of 0-15%. Land use/land cover in the watershed includes: 82.5% forested land, 8.7% water, 5.5% barren land, 2.7% forested wetland, 0.4% agricultural land, and 0.2% urban land.

The section of the Savannah River impounded between the Thurmond Dam and the Stevens Creek Dam forms the Stevens Creek Reservoir, which accepts drainage from its upper reaches and from Nixon Branch and Deep Step Creek. An asterisk connotes a stream entering from the Georgia side of the river. Lloyd Creek* enters the river next, followed by Kiokee Creek*, Little Kiokee Creek*, Little River*, Mauldin Branch, Deep Step Branch, Bussy Creek, and the Stevens Creek watershed. There are a total of 34.7 stream miles within the South Carolina portion of the watershed, all classified FW.

Surface Water Quality

Station #	Type	Class	Description
SV-294	P	FW	STEVENS CREEK RES. HEADWATERS AT CLARKS HILL DAM BOAT RAMP

Stevens Creek Reservoir (SV-294) – Near the headwaters of Stevens Creek Reservoir, aquatic life uses are partially supported due to dissolved oxygen and pH excursions. In addition, there is a decreasing trend in pH. Significant decreasing trends in five-day biochemical oxygen demand, turbidity, and total nitrogen concentration suggest improving conditions for these parameters. In sediment, P,P' DDT and its metabolite P,P' DDE were detected in the 1997 sample. Although the use of DDT was banned in 1973, it is very persistent in the environment. Recreational uses are fully supported; however, there is a significant increasing trend in fecal coliform bacteria concentrations.

A fish consumption advisory has been issued by the Department for mercury and includes the Savannah River within this watershed (see advisory p.107).

NPDES Program

Active NPDES Facilities

RECEIVING STREAM ***FACILITY NAME*** ***PERMITTED FLOW @ PIPE (MGD)***	***NPDES#*** ***TYPE*** ***COMMENT***
SAVANNAH RIVER US ARMY CORPS./LAKE THURMOND PIPE #: 001 FLOW: M/R	SC0047317 MINOR INDUSTRIAL

Growth Potential

There is a low potential for growth in this watershed, which contains a portion of the Town of Clarks Hill. The majority of the watershed resides within the Sumter National Forest and would tend to limit growth.

03060106-050

(Savannah River)

General Description

Watershed 03060106-050 is located in Edgefield and Aiken Counties and consists primarily of the ***Savannah River*** and its tributaries from the Stevens Creek Dam to Upper Three Runs. The watershed occupies 40,964 acres of the Piedmont, Sand Hills, and Upper Coastal Plain regions of South Carolina. The predominant soil types consist of an association of the Fuquay-Troup-Cataula-Cecil series. The erodibility of the soil (K) averages 0.20, and the slope of the terrain averages 7%, with a range of 0-15%. Land use/land cover in the watershed includes: 42.9% forested land, 20.7% forested wetland, 15.5% agricultural land, 11.1% urban land, 5.2% barren land, 4.0% water, and 0.6% nonforested wetland.

This section of the Savannah River accepts drainage from its upper reaches, together with Reed Creek*, Fox Creek (Pole Branch), Rock Creek*, the Horse Creek watershed, the Dead River (oxbow), and Butler Creek*. An asterisk connotes a stream entering from the Georgia side of the river. Further downstream, the river accepts drainage from Spirit Creek*, Pine Creek (Hardens Dead River, Horseshoe Lake, Clarkes Lake), the Hollow Creek watershed, Berryhill Gut (Coleman Lake), High Bank Creek*, McBean Creek*, Boggy Gut Creek*, Bent Lake, and Newberry Creek*. There are a total of 121.8 stream miles and 184.8 acres of lake waters within the South Carolina portion of the watershed, all classified FW. Redcliffe State Park resides in this watershed, as does a portion of the federally owned Savannah River Plant.

Surface Water Quality

Station #	Type	Class	Description
SV-251	P	FW	Savannah River at US 1, 1.5 mi SW N.Augusta
SV-252	P	FW	Savannah River at SC 28, 1.6 mi NNW of Beech Island
SV-323	P	FW	Savannah River at lock and dam

Savannah River* –** There are three stations along this section of the Savannah River. Recreational uses are fully supported **at all sites,** and a significant decreasing trend in fecal coliform bacteria concentration suggests improving conditions for this parameter **at all sites**. At the upstream site ***(SV-251), aquatic life uses are fully supported; however, there is a significant increasing trend in total phosphorus concentration. There is also a significant decreasing trend in pH. Significant decreasing trends in five-day biochemical oxygen demand and total nitrogen concentration suggest improving conditions for these parameters.

Aquatic life uses are also fully supported further downstream ***(SV-252)***. There is a significant decreasing trend in pH. Significant decreasing trends in five-day biochemical oxygen demand, turbidity, and total nitrogen concentration suggest improving conditions for these parameters. At the furthest downstream site ***(SV-323),*** aquatic life uses are fully supported. There is a significant decreasing trend in pH. Significant decreasing trends in five-day biochemical oxygen demand and total nitrogen concentration suggest improving conditions for these parameters. In sediments, a high concentration of mercury was detected in the 1996 sample and dibutyl phthalate was detected in the 1999 sample.

A fish consumption advisory has been issued by the Department for mercury and includes the Savannah River within this watershed (see advisory p.107).

NPDES Program

Active NPDES Facilities

RECEIVING STREAM	***NPDES#***
FACILITY NAME	***TYPE***
PERMITTED FLOW @ PIPE (MGD)	***COMMENT***
SAVANNAH RIVER TRIBUTARY	SCG645036
ECW&SA/WTP	MINOR INDUSTRIAL
PIPE #: 001 FLOW: M/R	
SAVANNAH RIVER	SC0000582
KIMBERLY-CLARK CORP./BEECH ISLAND	MAJOR INDUSTRIAL
PIPE #: 001 FLOW: 11.452	
SAVANNAH RIVER	SC0000574
SCE&G/URQUHART STEAM STATION	MAJOR INDUSTRIAL
PIPE #: 001 FLOW: 190	
PIPE #: 002, 003 FLOW: M/R	
SAVANNAH RIVER	SC0024457
AIKEN PSA/HORSE CREEK WWTP	MAJOR INDUSTRIAL
PIPE #: 001 FLOW: 26.0	

Nonpoint Source Management Program

Land Disposal Activities

Landfill Facilities

LANDFILL NAME	***PERMIT #***
FACILITY TYPE	***STATUS***
MASONS TREE & TURF FARM	IWP-182
INDUSTRIAL	CLOSED
SCE&G URQUART	023320-1601
INDUSTRIAL	ACTIVE
SCE&G URQUART	IWP-009
INDUSTRIAL	INACTIVE
KIMBERLY-CLARK CORP.	SCD042971069
INDUSTRIAL	ACTIVE

Land Application Sites

LAND APPLICATION SYSTEM	***ND#***
FACILITY NAME	***TYPE***
INFILTRATION POND	ND0067113
BEECHWOOD SD	DOMESTIC

Mining Activities

MINING COMPANY *MINE NAME*	*PERMIT #* *MINERAL*
THE MARTIN GROUP RAIFORD PIT	1009-03 SAND/CLAY
HANSON AGGREGATES SOUTHEAST BEECH ISLAND PLANT #1	0801-03 SAND/GRAVEL
WERTS EQUIPMENT RENTAL, INC. BEECH ISLAND MINE	0845-03 SAND/CLAY

Water Quantity

WATER USER *STREAM*	*TOTAL PUMP. CAPACITY (MGD)* *RATED PUMP. CAPACITY (MGD)*
ECWSA SAVANNAH RIVER	10.0 7.0
CITY OF NORTH AUGUSTA SAVANNAH RIVER	25.8 14.0

Growth Potential

There is a moderate potential for growth in this watershed, which contains portions of the Town of Jackson and the City of North Augusta. The City of North Augusta is currently experiencing a northward push towards I-20 and Augusta, Georgia. This growth is primarily residential and commercial; the trend is expected to continue. Projected growth includes the area surrounding the seven interchanges of I-20 in Aiken County, particularly in the intersection of I-20 and S.C. Hwy 19, and that of I-20 and U.S. Hwy 1. S.C. 19 is expected to be widened to four lanes in the near future.

03060106-060

(Horse Creek)

General Description

Watershed 03060106-060 is located in Edgefield and Aiken Counties and consists primarily of ***Horse Creek*** and its tributaries. The watershed occupies 103,305 acres of the Sand Hills and Upper Coastal Plain regions of South Carolina. The predominant soil types consist of an association of the Lakeland-Fuquay-Troup series. The erodibility of the soil (K) averages 0.12, and the slope of the terrain averages 5%, with a range of 2-25%. Land use/land cover in the watershed includes: 62.7% forested land, 14.6% barren land, 10.0% urban land, 9.8% agricultural land, 1.5% forested wetland, 1.2% water, and 0.2% nonforested wetland.

Horse Creek accepts drainage from Long Branch, Little Horse Creek (Bear Branch, Gopher Branch, Beaver Branch), and Camp Branch before flowing through Vaucluse Pond. Horse Creek then accepts drainage from Good Spring Branch and Sage Mill Branch and flows through Flat Rock Pond. Bridge Creek (Bridge Creek Pond, Graniteville Pond) and the Sand River enter Horse Creek next before it flows through Langley Pond. Little Horse Creek accepts drainage from Simons Lake, Red Hill Branch (Eggleston Lake), Arrowhead Lakes, Antique Lake, Horsepen Creek, Hightower Creek (Ascauga Lake), Franklin Branch, Sudlow Lake, and Mims Branch. Little Horse Creek then flows through Clearwater Lake before merging with Horse Creek downstream of Langley Pond. Storm Branch drains into Horse Creek downstream of the confluence. Horse Creek drains into the Savannah River. There are a total of 200.6 stream miles and 1,148.6 acres of lake waters in this watershed, all classified FW.

Surface Water Quality

Station #	Type	Class	Description
CL-067	W	FW	Vaucluse Pond in forebay near dam
SV-686	W	FW	Flat Rock Pond in forebay near dam
SV-722	W/BIO	FW	Graniteville Pond #2 in forebay near dam
SV-329	P	FW	Horse Creek at Ascauga Lake rd (S-02-33) in Graniteville
SV-071	P	FW	Horse Creek at S-02-104, 0.6 mi SW Graniteville
SV-069	P	FW	Sand River at old US 1, 1.2 mi SE Warrenville
CL-069	W/BIO	FW	Langley Pond in forebay near dam
SV-096	P	FW	Horse Creek below Langley Pond at S-02-254
SV-724	BIO	FW	Little Horse Creek at S-02-104
SV-073	S	FW	Little Horse Creek at SC 421, below effl. of clearwater finishing
SV-072	S	FW	Horse Creek at S-02-145
SV-250	P	FW	Horse Creek at SC 125, 1.5mi SW Clearwater

Vaucluse Pond (CL-067)) – Aquatic life uses are fully supported. This is a blackwater system, characterized by naturally low pH. Although pH excursions occurred, they are typical of values seen in blackwater systems and are considered natural, not standards violations. Recreational uses are fully supported.

Flat Rock Pond (SV-686) - Aquatic life uses are fully supported. This is a blackwater system, characterized by naturally low pH. Although pH excursions occurred, they are typical of values seen in blackwater systems and are considered natural, not standards violations. Recreational uses are fully supported.

Graniteville Pond #2 (SV-722) - Aquatic life uses are fully supported. This is a blackwater system, characterized by naturally low pH. Although pH excursions occurred, they are typical of values seen in blackwater systems and are considered natural, not standards violations. Recreational uses are fully supported.

Horse Creek – There are five monitoring sites along Horse Creek. Aquatic life uses are fully supported at the upstream site ***(SV-329);*** however, there is a significant increasing trend in total phosphorus concentration. This is a blackwater system, characterized by naturally low pH. Although pH excursions occurred, they are typical of values seen in blackwater systems and are considered natural, not standards violations. There is a significant decreasing trend in pH. Significant decreasing trends in five-day biochemical oxygen demand and total nitrogen concentration suggest improving conditions for these parameters. Recreational uses are fully supported at this site; however, there is a significant increasing trend in fecal coliform bacteria concentration.

At the next site downstream ***(SV-071),*** aquatic life uses are not supported due to pH excursions. There is also a significant decreasing trend in pH. Significant decreasing trends in five-day biochemical oxygen demand and total nitrogen concentration suggest improving conditions for these parameters. Recreational uses are fully supported at this site and a significant decreasing trend in fecal coliform bacteria concentration suggests improving conditions for this parameter.

Further downstream ***(SV-096),*** aquatic life uses are partially supported due to pH excursions. There is also a significant decreasing trend in pH. A significant decreasing trend in five-day biochemical oxygen demand suggests improving conditions for this parameter. In sediments, a high concentration of zinc was detected in the 1996 sample. P,P' DDT was detected in the 1996 sediment sample. Although the use of DDT was banned in 1973, it is very persistent in the environment. Recreational uses are fully supported at this site.

Aquatic life uses are fully supported at the next site downstream ***(SV-072)*** based on macroinvertebrate community data. This is a blackwater system, characterized by naturally low pH. Although pH excursions occurred, they are typical of values seen in blackwater systems and are considered natural, not standards violations. There is a significant decreasing trend in pH. A significant decreasing trend in five-day biochemical oxygen demand suggests improving conditions for this parameter. In sediments, high concentrations of chromium were detected in 1997 and 1999 samples and very high concentrations were detected in 1996 and 1998 samples. A very high concentration of mercury was also measured in the 1996 sample. P,P'DDE, a metabolite of DDT, was detected in the 1996 sediment sample. PCB 1254 was detected in the 1998 sediment sample. Although the manufacture and use of PCBs was banned in 1979, they are very persistent in the environment. Recreational uses are partially supported at this site due to fecal coliform bacteria excursions.

At the furthest downstream site ***(SV-250)***, aquatic life uses are not supported due to pH excursions, and compounded by a significant decreasing trend in pH. In sediments, a high concentration of chromium was measured in the 1996 sample and a very high concentration was measured in the 1999 sample. Also, a very high concentration of mercury was measured in the 1996 sample and a high concentration of mercury was measured in the 1999 sample. Recreational uses are partially supported at this site due to fecal coliform bacteria excursions. In addition, there is a significant increasing trend in fecal coliform bacteria concentration.

Sand River (SV-069) – Aquatic life uses are fully supported based on macroinvertebrate community data. This is a blackwater system, characterized by naturally low pH. Although pH excursions occurred, they are typical of values seen in blackwater systems and are considered natural, not standards violations. Significant decreasing trends in turbidity and total nitrogen concentration suggest improving conditions for these parameters. Recreational uses are fully supported.

Langley Pond (CL-069) - Aquatic life uses are fully supported. This is a blackwater system, characterized by naturally low pH. Although pH excursions occurred, they are typical of values seen in blackwater systems and are considered natural, not standards violations. Recreational uses are fully supported.

Little Horse Creek (SV-073)) - There are two monitoring sites along Little Horse Creek. Aquatic life uses are fully supported at the upstream site ***(SV-724)*** based on macroinvertebrate community data. At the downstream site ***(SV-073),*** aquatic life uses are partially supported due to pH excursions. This is compounded by a significant decreasing trend in pH. A significant increasing trend in dissolved oxygen concentration and a significant decreasing trend in five-day biochemical oxygen demand suggest improving conditions for these parameters. Endosulfan sulfate was detected in the 1996 sediment sample, and PCB 1254 was detected in the 1999 sample. Although the manufacture and use of PCBs was banned in 1979, they are very persistent in the environment. Recreational uses are fully supported at this site.

A fish consumption advisory has been issued by the Department for mercury and includes Langley Pond and Vaucluse Pond within this watershed (see advisory p.107).

Natural Swimming Areas

FACILITY NAME ***RECEIVING STREAM***	***PERMIT #*** ***STATUS***
OUTING CLUB BRIDGE CREEK	02-N14 ACTIVE
GREFF PARK BRIDGE CREEK	02-N07 ACTIVE
LANGLEY POND PARK LANGLEY POND	02-1002N ACTIVE

Groundwater Quality

Well #	Class	Aquifer	Location
AMB-027	GB	MIDDENDORF	NORTH AUGUSTA

All water samples collected from ambient monitoring well ***AMB-027*** met standards for Class GB groundwater.

NPDES Program

Active NPDES Facilities

RECEIVING STREAM	***NPDES#***
FACILITY NAME	***TYPE***
PERMITTED FLOW @ PIPE (MGD)	***COMMENT***
HORSE CREEK	SC0039730
AIR PRODUCTS POLYMERS, LP	MINOR INDUSTRIAL
PIPE #: 001 FLOW: 4.75	
HORSE CREEK	SCG641001
AVONDALE MILLS WTP	MINOR INDUSTRIAL
PIPE #: 001 FLOW: 0.096	
HORSE CREEK	SC0032638
GREEN ACRES MHP	MINOR DOMESTIC
PIPE #: 001 FLOW: 0.017	
HORSE CREEK TRIBUTARY	SC0040096
KENTUCKY-TENN CLAY/CONGER PLT	MINOR INDUSTRIAL
PIPE #: 001 FLOW: 0.021	
HORSE CREEK TRIBUTARY	SCG730387
KENTUCKY-TENN CLAY/PARAGON MINE	MINOR INDUSTRIAL
PIPE #: 001 FLOW: 0.015	
HORSE CREEK	SC0027529
FOSTER DIXIANA/AUGUSTA PLT	MINOR INDUSTRIAL
PIPE #: 001 FLOW: M/R	
LITTLE HORSE CREEK	SCG730221
MARTIN MARIETTA/AIKEN QUARRY	MINOR INDUSTRIAL
PIPE #: 001 FLOW: 1.44	
FRANKLIN BRANCH	SCG340016
CHARTER-TRIAD TERMINALS, LLC	MINOR INDUSTRIAL
PIPE #: 001 FLOW: M/R	

Nonpoint Source Management Program

Land Disposal Activities

Landfill Facilities

LANDFILL NAME	***PERMIT #***
FACILITY TYPE	***STATUS***
GL WILLIAMS C&D LANDFILL	022481-1201
C & D	ACTIVE
RAINBOW FALLS RD C&D LANDFILL	-----------
C & D	ACTIVE

VALCLUSE DUMP DOMESTIC	----------- INACTIVE
CYPRESS INDUSTRIAL MINERAL INDUSTRIAL	IWP-111 INACTIVE
AIKEN COUTNY CELLULOSIC CONSTR. LANDFILL C & D	021001-1202 (CWP-038) ACTIVE
JM HUBER CORPORATION DOMESTIC	021001-1201 (CWP-014) INACTIVE
AIKEN COUNTY LANGLEY LANDFILL DOMESTIC	DWP-123; DWP-066; 021001-1103 DWP-056; 021001-1104; DWP-097 INACTIVE
CARLINE ROAD DUMP DOMESTIC	------------ INACTIVE
AIKEN COUNTY PSA INDUSTRIAL	(IWP-161) SCD980842454 INACTIVE
AUGUSTA/N. AUGUSTA MATERIAL RECOVERY DOMESTIC	021003-2001 ACTIVE
CITY OF NORTH AUGUSTA DUMP DOMESTIC	SCD980844146 INACTIVE
HR GARRET INC. C & D	022458-1701 INACTIVE
KIMBERLY-CLARK BEECH ISLAND MILL INDUSTRIAL	IWP-106 INACTIVE

Mining Activities

MINING COMPANY ***MINE NAME***	***PERMIT #*** ***MINERAL***
MABUS BROTHERS CONSTR. CO. CHAMBERS MINE	1403-03 SAND
WILLIAMS & SON TRUCKING HILLTOP MINE	0720-03 SAND
WILLIAMS SAND & GRAVEL CO. RAINBOW FALLS PIT	0702-03 SAND
DIXIE CLAY CO. PARDUE MINE	0451-03 KAOLIN
SATTERFIELD CONSTRUCTION TIMMERMAN SAND PIT	0230-03 SAND

KENTUCKY-TENN CLAY CO. CONGER MINE	0037-03 KAOLIN
WILLIAMS & SON TRUCKING HWY 421 NO. 2 MINE	1041-03 SAND; SAND/CLAY
DAVIS AGGREGATES CORP. CLEARWATER BELVEDERE MINE	0862-03 SAND; SAND/CLAY
CITY OF NORTH AUGUSTA CITY OF NORTH AUGUSTA CLAY PIT	0988-03 SAND; SAND/CLAY
WERTS EQUIPMENT RENTAL, INC. WERTS DRIVE IN	0949-03 SAND/CLAY
FOSTER DIXIANA CORP. CLEARWATER MINE	0006-03 SAND
MUNDYS CONSTRUCTION, INC. MUNDY BORROW PIT	1155-03 SAND; SAND/CLAY
DIXIE CLAY CO. MCNAMEE MINE	0073-03 KAOLIN
AIKEN COUNTY PUBLIC WORKS IDEAL MINE	0036-03 KAOLIN
KENTUCKY-TENN CLAY CO. PARAGON MINE	0034-03 KAOLIN

Water Quantity

WATER USER ***STREAM***	***TOTAL PUMP. CAPACITY (MGD)*** ***RATED PUMP. CAPACITY (MGD)***
GRANITEVILLE CO. FLAT ROCK POND/HORSE CREEK	2.0 2.0

Growth Potential

There is a moderate potential for growth in this watershed, which contains portions of the Cities of Aiken and North Augusta. The City of Aiken is experiencing growth in a southwesterly direction toward the Savannah River Site. Growth is predominately residential; numerous subdivisions are being developed. Commercial centers are also being constructed in conjunction with the population growth and residential development. Aiken has the permit for expansion of Aiken County’s Horse Creek Treatment Plant to handle potential growth.

S.C. Hwys 19 (towards New Ellenton and SRS) and 302 (towards Augusta and SRS) are the major commercial corridors serving the residential communities. Growth is expected to continue south and southwest instead of in previously established areas. Industrial growth is expected to occur along S.C. 19 to New Ellenton and west towards North Augusta, along the Horse Creek drainage.

03060106-070

(Hollow Creek)

General Description

Watershed 03060106-070 is located in Aiken County and consists primarily of ***Hollow Creek*** and its tributaries. The watershed occupies 71,288 acres of the Sand Hills and Upper Coastal Plain region of South Carolina. The predominant soil types consist of an association of the Fuquay-Troup-Chewacla series. The erodibility of the soil (K) averages 0.17, and the slope of the terrain averages 4%, with a range of 0-25%. Land use/land cover in the watershed includes: 50.0% forested land, 9.7% barren land, 27.2% agricultural land, 9.0% forested wetland, 3.2% urban land, 0.7% water, and 0.2% nonforested wetland.

Hollow Creek originates in the City of Aiken and accepts drainage from Anderson Millpond, Dry Branch, Town Creek (Craig Pond, Gem Lake, Wilson Pond, Richardsons Lake, Herndon Pond, Johnsons Lake, McElmurray Pond, Lake Florence, Long Branch), Kathwood Lakes, and Bear Island Creek (Neal Creek, Musterfield Branch, Curry Branch). There are a total of 131.3 stream miles and 440.6 acres of lake waters within this watershed, all classified FW.

Surface Water Quality

Station #	Type	Class	Description
SV-350	W/BIO	FW	HOLLOW CREEK AT S-02-5

Hollow Creek (SV-350) - Aquatic life uses are fully supported based on macroinvertebrate community. Although pH excursions occurred, they are typical of values seen in blackwater systems and are considered natural, not standards violations. Recreational uses are partially supported due to fecal coliform bacteria excursions.

Natural Swimming Areas

FACILITY NAME ***RECEIVING STREAM***	***PERMIT #*** ***STATUS***
RICHARDSONS LAKE RICHARDSONS LAKE	02-N01 ACTIVE
GEM LAKE GEM LAKE	02-N11 ACTIVE

NPDES Program

Active NPDES Facilities

RECEIVING STREAM	***NPDES#***
FACILITY NAME	***TYPE***
PERMITTED FLOW @ PIPE (MGD)	***COMMENT***
BEAR ISLAND CREEK	SCG250202
PACTIV CORP./BEECH ISLAND FACILITY	MINOR INDUSTRIAL
PIPE #: 001, 003 FLOW: 0.0013	
PIPE #: 002, 004 FLOW: 0.008	

Nonpoint Source Management Program

Land Disposal Activities

Land Application Sites

LAND APPLICATION SYSTEM	***ND#***
FACILITY NAME	***TYPE***
LOW PRESSURE ADSORPTION FIELD	ND0014010
SILVER BLUFF HIGH	DOMESTIC
WOODED SPRAY AREAS	ND0066893
CWS GEM LAKES SD	DOMESTIC

Mining Activities

MINING COMPANY	***PERMIT #***
MINE NAME	***MINERAL***
DIXIE CLAY CO.	0074-03
RANDALL MINE	KAOLIN
KENTUCKY TENN CLAY COMPANY	0033-03
RICHARDSON MINE	KAOLIN
KENTUCKY TENN CLAY COMPANY	0874-03
EUBANKS MINE	KAOLIN

Growth Potential

There is a low to moderate potential for growth in this watershed, which contains portions of the Towns of New Ellenton and Jackson, and a portion of the City of Aiken. The City of Aiken is experiencing growth in a southwesterly direction toward the Savannah River Site. Growth is predominately residential; numerous subdivisions are being developed. Commercial centers are also being constructed in conjunction with the population growth and residential development. Aiken has the permit for expansion of Aiken County’s Horse Creek Treatment Plant to handle potential growth.

S.C. Hwys 19 (towards New Ellenton and SRS) and 302 (towards Augusta and SRS) are the major commercial corridors serving the residential communities. Growth is expected to continue south and southwest instead of in previously established areas. Industrial growth is expected to occur along S.C. 19 to New Ellenton and west towards North Augusta, along the Horse Creek drainage.

03060106-100

(Upper Three Runs)

General Description

Watershed 03060106-100 is located in Aiken and Barnwell Counties and consists primarily of the ***Upper Three Runs*** and its tributaries. The watershed occupies 157,409 acres of the Sand Hills and Upper Coastal Plain regions of South Carolina. The predominant soil types consist of an association of the Fuquay-Troup-Ailey-Vaucluse series. The erodibility of the soil (K) averages 0.13, and the slope of the terrain averages 6%, with a range of 0-25%. Land use/land cover in the watershed includes: 57.4% forested land, 16.8% barren land, 12.9% agricultural land, 9.9% forested wetland, 2.7% urban land, 0.2% water, and 0.1% nonforested wetland.

Upper Three Runs accepts drainage from Tarrants Millpond, Jackson Branch, Cedar Creek (Chapman Pond), Boggy Gut (Beulah Fork, Dicks Pond, Cooks Pond), Johnson Fork, Tinker Creek (Riley Pond, Reedy Branch, Mill Creek, McQueen Branch), Crouch Branch, Tims Branch, and Island Creek (Brent Lake). There are a total of 223.7 stream miles and 198.3 acres of lake waters, all classified FW.

Surface Water Quality

Station #	Type	Class	Description
SV-680	BIO	FW	UPPER THREE RUNS AT S-02-113
SV-723	BIO	FW	CEDAR CREEK AT S-02-79
SV-324	P	FW	TIMS BRANCH AT SRS ROAD C
SV-325	P	FW	UPPER THREE RUNS AT SRS ROAD A

Upper Three Runs* –** There are two monitoring sites along Upper Three Runs. At the upstream site ***(SV-680), aquatic life uses are fully supported based on macroinvertebrate community data. At the downstream site ***(SV-325),*** aquatic life uses are fully supported. This is a blackwater system, characterized by naturally low pH. Although pH excursions occurred, they are typical of values seen in blackwater systems and are considered natural, not standards violations. Significant decreasing trends in five-day biochemical oxygen demand and total nitrogen concentration suggest improving conditions for these parameters. In sediments, P,P'DDE, a metabolite of DDT, was detected in the 1998 sediment sample. Although the use of DDT was banned in 1973, it is very persistent in the environment. Recreational uses are fully supported at this site.

Cedar Creek (SV-723) - Aquatic life uses are fully supported based on macroinvertebrate community data.

Tims Branch (SV-324) - Aquatic life uses are fully supported. This is a blackwater system, characterized by naturally low pH. Although pH excursions occurred, they are typical of values seen in blackwater systems and are considered natural, not standards violations. There is a significant decreasing trend in pH. Significant decreasing trends in total phosphorus and total nitrogen concentrations suggest improving conditions for these parameters. Recreational uses are partially supported due to fecal coliform bacteria excursions.

NPDES Program

Active NPDES Facilities

RECEIVING STREAM ***FACILITY NAME*** ***PERMITTED FLOW @ PIPE (MGD)***	***NPDES#*** ***TYPE*** ***COMMENT***
TIMS BRANCH TRIBUTARY USDOE WESTINGHOUSE SRS PIPE #: A11 FLOW: 0.851 PIPE #: A01 FLOW: 0.572 PIPE #: M05 FLOW: 0.878	SC0000175 MAJOR INDUSTRIAL
UPPER THREE RUNS USDOE WESTINGHOUSE SRS PIPE #: F05 FLOW: 0.06 PIPE #: F02 FLOW: 0.145 PIPE #: H16 FLOW: 0.105 PIPE #: F01 FLOW: 0.036	SC0000175 MAJOR INDUSTRIAL
CROUCH BRANCH TRIBUTARY USDOE WESTINGHOUSE SRS PIPE #: H02 FLOW: 0.12 PIPE #: H04 FLOW: 0.01	SC0000175 MAJOR INDUSTRIAL
MCQUEEN BRANCH TRIBUTARY USDOE WESTINGHOUSE SRS PIPE #: H07 FLOW: 0.05	SC0000175 MAJOR INDUSTRIAL
MCQUEEN BRANCH USDOE WESTINGHOUSE SRS PIPE #: S04 FLOW: 0.036	SC0000175 MAJOR INDUSTRIAL

Nonpoint Source Management Program

Land Disposal Activities

Landfill Activities

SOLID WASTE LANDFILL NAME ***FACILITY TYPE***	***PERMIT #*** ***STATUS***
TOWN OF NEW ELLENTON DUMP DOMESTIC	------------- INACTIVE
TOWN OF JACKSON DUMP DOMESTIC	------------- INACTIVE
THREE RIVERS TIRE PROCESSING TIRE PROCESSING	024202-5201 ACTIVE
THREE RIVERS SUBTITLE D LANDFILL DOMESTIC	024202-1101 ACTIVE

BURMA ROAD INDUSTRIAL	025800-1601 INACTIVE
SRS BURN ROAD C/C C/C	025500-1201 (CWP-030) INACTIVE
SRS D-F STEAMLINE INDUSTRIAL	025500-1601 INACTIVE
SRS 200-F SITE 1, 4 INDUSTRIAL	025500-1602, IWP-219 INACTIVE
SRS Z-AREA SALTSTONE IND. SITE INDUSTRIAL	025500-1603, IWP-217 ACTIVE
SRS DOE DOMESTIC	025500-1102, DWP-087 INACTIVE

Land Application Sites

LAND APPLICATION SYSTEM ***FACILITY NAME***	***ND#*** ***TYPE***
SPRAYFIELD TOWN OF NEW ELLENTON	ND0068454 DOMESTIC

Growth Potential

There is a moderate potential for growth in this watershed, which contains portions of the City of Aiken, the Towns of New Ellenton and Jackson, and the Savannah River Site. The City of Aiken is experiencing growth in a southwesterly direction toward the Savannah River Site. Growth is predominately residential; numerous subdivisions are being developed. Commercial centers are also being constructed in conjunction with the population growth and residential development. Aiken has the permit for expansion of Aiken County's Horse Creek Treatment Plant to handle potential growth.

S.C. Hwys 19 (towards New Ellenton and SRS) and 302 (towards Augusta and SRS) are the major commercial corridors serving the residential communities. Growth is expected to continue south and southwest instead of in previously established areas. Industrial growth is expected to occur along S.C. 19 to New Ellenton and west towards North Augusta, along the Horse Creek drainage. The Savannah River Site covers the lower half of the watershed. The Savannah River Site employs 25,000 people from nearby counties and is responsible for the overall growth in proximity to the site.

03060106-110

(Savannah River)

General Description

Watershed 03060106-110 is located in Aiken, Barnwell, and Allendale Counties and consists primarily of the ***Savannah River*** and its tributaries from Upper Three Runs to Lower Three Runs. The watershed occupies 88,035 acres of the Sand Hills, Upper Coastal Plain, and Lower Coastal Plain regions of South Carolina. The predominant soil types consist of an association of the Fuquay-Dothan-Troup series. The erodibility of the soil (K) averages 0.15, and the slope of the terrain averages 3%, with a range of 0-10%. Land use/land cover in the watershed includes: 58.6% forested land, 21.7% forested wetland, 9.9% barren land, 4.9% agricultural land, 1.6% urban land, 2.0% water, and 1.3% nonforested wetland.

This section of the Savannah River accepts drainage from its upper reaches (03060103 and 03060106-050), together with Beaverdam Creek, Fourmile Branch, Beaverdam Creek*, Pen Branch (Indian Grave Branch), and Little Beaverdam Creek*. An asterisk connotes a stream entering from the Georgia side of the river. Steel Creek (L-Lake, Meyers Branch) enters the river next, followed by Boggy Gut Branch, Brier Branch (The Bay), Swift Gut, Sweetwater Creek*, Little Sweetwater Creek*, and Cator Hall Lake. There are a total of 150.0 stream miles and 164.8 acres of lake waters within the South Carolina portion of the watershed, all classified FW.

Surface Water Quality

Station #	Type	Class	Description
SV-326	P	FW	FOURMILE BRANCH AT SRS ROAD A-7
SV-327	P	FW	STEEL CREEK AT SRS ROAD A

Fourmile Creek (SV-326) - Aquatic life uses are fully supported; however, there is a significant increasing trend in total phosphorus concentration. There is also a significant decreasing trend in pH. A significant decreasing trend in five-day biochemical oxygen demand suggests improving conditions for this parameter. Recreational uses are partially supported due to fecal coliform bacteria excursions.

Steel Creek (SV-327) - Aquatic life uses are fully supported; however, there is a significant increasing trend in total phosphorus concentration. There is also a significant decreasing trend in pH. A significant increasing trend in dissolved oxygen concentration and significant decreasing trends in five-day biochemical oxygen demand, turbidity, and total nitrogen concentration suggest improving conditions for these parameters. Recreational uses are fully supported; however, there is a significant increasing trend in fecal coliform bacteria concentration.

A fish consumption advisory has been issued by the Department for mercury and includes the Savannah River within this watershed (see advisory p.107).

NPDES Program

Active NPDES Facilities

RECEIVING STREAM ***FACILITY NAME*** ***PERMITTED FLOW @ PIPE (MGD)***	***NPDES#*** ***TYPE*** ***COMMENT***
INDIAN GRAVE BRANCH USDOE WESTINGHOUSE SRS PIPE #: K18 FLOW: 0.42 PIPE #: K06 FLOW: 0.011 PIPE #: K08 FLOW: M/R PIPE #: K12 FLOW: 0.024	SC0000175 MAJOR INDUSTRIAL
SAVANNAH RIVER SWAMP USDOE WESTINGHOUSE SRS PIPE #: X8C FLOW: 0.097	SC0000175 MAJOR INDUSTRIAL
BEAVERDAM CREEK USDOE WESTINGHOUSE SRS PIPE #: D1A FLOW: 0.0035	SC0000175 MAJOR INDUSTRIAL
BEAVERDAM CREEK SCE&G/SRS D-AREA POWER HOUSE PIPE #: D01 FLOW: 54.35 PIPE #: D03 FLOW: 0.023 PIPE #: D06 FLOW: 0.111	SC0047431 MAJOR INDUSTRIAL
FOURMILE BRANCH TRIBUTARY USDOE WESTINGHOUSE SRS PIPE #: H12 FLOW: 0.49 PIPE #: F08 FLOW: 1.53 PIPE #: H08 FLOW: 0.66	SC0000175 MAJOR INDUSTRIAL
FOURMILE BRANCH USDOE WESTINGHOUSE SRS PIPE #: G10 FLOW: 1.05	SC0000175 MAJOR INDUSTRIAL
L-LAKE USDOE WESTINGHOUSE SRS PIPE #: L07 FLOW: 41.7 PIPE #: L7A FLOW: 0.035	SC0000175 MAJOR INDUSTRIAL

Nonpoint Source Management Program

Land Disposal Activities

Landfill Activities

SOLID WASTE LANDFILL NAME ***FACILITY TYPE***	***PERMIT #*** ***STATUS***
SRS STEAMLINE INDUSTRIAL	IWP-210 INACTIVE
SRS 200-H SITE INDUSTRIAL	IWP-211 INACTIVE

WESTINGHOUSE SRS	025800-1901
INDUSTRIAL	ACTIVE

Growth Potential

There is a moderate potential for growth in this watershed, which contains the Savannah River Site. The Savannah River Site, which covers the majority of the watershed, employs 25,000 people from nearby counties and is responsible for the overall growth in proximity to the site.

03060106-130

(Lower Three Runs/Par Pond)

General Description

Watershed 03060106-130 is located in Barnwell and Allendale Counties and consists primarily of ***Lower Three Runs*** and its tributaries. The watershed occupies 55,350 acres of the Sand Hills, Upper Coastal Plain, and Lower Coastal Plain regions of South Carolina. The predominant soil types consist of an association of the Blanton-Fuquay series. The erodibility of the soil (K) averages 0.13, and the slope of the terrain averages 3%, with a range of 0-10%. Land use/land cover in the watershed includes: 48.6% forested land, 20.8% barren land, 18.0% agricultural land, 8.3% forested wetland, 3.1% water, 0.6% urban land, and 0.6% nonforested wetland.

Ponds A, B, and C form one arm of Par Pond, and Ponds 2, 4, and 5 form another arm. Downstream of Par Pond, Lower Three Runs accepts drainage from Gantts Mill Creek (Patterson Branch), Bodiford Mill Creek, Miller Creek (Bentley Branch, Fiddle Pond Creek), Davis Branch, Furse Mill Creek (Mill Creek, Browns Pond, Furse Creek, Furse Pond, Johnson Pond, Terry Pond), The Big Bay (Lake Echee), and Smith Lake Creek. There are a total of 139.10 stream miles and 948.4 acres of lake waters within this watershed, all classified FW.

Surface Water Quality

Station #	Type	Class	Description
SV-328	P/BIO	FW	LOWER THREE RUNS AT S-0620, 7.5MI SW BARNWELL
SV-175	S	FW	LOWER THREE RUNS AT SC 125, 11MI NW ALLENDALE

Lower Three Runs - There are two monitoring sites along Lower Three Runs. Aquatic life uses are fully supported at the upstream site **(SV-328)** based on macroinvertebrate community, physical, and chemical data; however, there is a significant increasing trend in turbidity. There is also a significant decreasing trend in pH. A significant increasing trend in dissolved oxygen concentration and significant decreasing trends in five-day biochemical oxygen demand and total nitrogen concentration suggest improving conditions for these parameters. Recreational uses are fully supported at this site; however, there is a significant increasing trend in fecal coliform bacteria concentration.

At the downstream site ***(SV-175),*** aquatic life uses are fully supported. There is a significant decreasing trend in pH. A significant increasing trend in dissolved oxygen concentration and a significant decreasing trend in five-day biochemical oxygen demand suggest improving conditions for these parameters. In sediments, P,P'DDE, a metabolite of DDT, was detected in the 1998 sediment sample. Although the use of DDT was banned in 1973, it is very persistent in the environment. Recreational uses are fully supported at this site; however, there is a significant increasing trend in fecal coliform bacteria concentration.

Natural Swimming Areas

FACILITY NAME *RECEIVING STREAM*	*PERMIT #* *STATUS*
FURSE POND FURSE MILL CREEK	03-N01 ACTIVE

NPDES Program

Active NPDES Facilities

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)*	*NPDES#* *TYPE* *COMMENT*
LOWER THREE RUNS STARMET CMI PIPE #: 001, 002 FLOW: M/R	SCG250052 MINOR INDUSTRIAL
PAR POND TRIBUTARY USDOE WESTINGHOUSE SRS PIPE #: PP1 FLOW: 0.00121	SC0000175 MAJOR INDUSTRIAL

Nonpoint Source Management Program

Land Disposal Activities

Landfill Activities

SOLID WASTE LANDFILL NAME *FACILITY TYPE*	*PERMIT #* *STATUS*
ALLIED GENERAL NUCLEAR SERVICES INDUSTRIAL	IWP-130 ------------

Land Application Sites

LAND APPLICATION SYSTEM *FACILITY NAME*	*ND#* *TYPE*
SPRAYFIELDS SC ADVANCED TECHNOLOGY PARK WWTP	ND0080985 DOMESTIC

Growth Potential

There is a low to moderate potential for growth in this watershed, which contains portions of the Towns of Snelling and Kline, and the Savannah River Site. The Savannah River Site extends across the upper portion of the watershed. The Savannah River Site employs 25,000 people from nearby counties and is responsible for the overall growth in proximity to the site. There has been a small increase in residential growth in the non-SRS area of the watershed as a result of SRS activities.

03060106-140

(Savannah River)

General Description

Watershed 03060106-140 is located in Allendale County and consists primarily of the ***Savannah River*** and its tributaries from Lower Three Runs to the oxbow lake at Brier Creek Landing, Georgia. The watershed occupies 123,135 acres of the Lower Coastal Plain region of South Carolina. The predominant soil types consist of an association of the Blanton-Ogeechee-Chisolm series. The erodibility of the soil (K) averages 0.16, and the slope of the terrain averages 2%, with a range of 0-6. Land use/land cover in the watershed includes: 54.7% forested land, 19.4% forested wetland, 18.5% agricultural land, 6.3% barren land, 0.7% water, 0.3% nonforested wetland, and 0.1% urban land.

This section of the Savannah River accepts drainage from its upper reaches (03060103, 03060106-050, -110), together with Smith Lake Creek, Dead River Lake, Mount Lake (Spring Run), McDaniel Creek*, Brier Creek (Stony Creek), Little Brier Creek (Warren Branch, Mars Branch), Ferguson Lake, Watch Call Branch (Bull Pond), The Gaul King Creek, Blue Lake, Pipe Creek, and Brier Creek*. An asterisk connotes a stream entering from the Georgia side of the river. There are a total of 110.8 stream miles and 171.8 acres of lake waters within the South Carolina portion of the watershed, all classified FW.

Surface Water Quality

Station #	Type	Class	Description
SV-118	P	FW	SAVANNAH RIVER AT US 301, 12.5 MI SW OF ALLENDALE
SV-745	BIO	FW	BRIER CREEK AT S-03-102

Savannah River (SV-118) - Aquatic life uses are fully supported; however, there is a significant increasing trend in total phosphorus concentration. There is also a significant decreasing trend in pH. A significant decreasing trend in total nitrogen concentration suggests improving conditions for this parameter. Recreational uses are fully supported and a significant decreasing trend in fecal coliform bacteria concentration suggests improving conditions for this parameter.

Brier Creek (SV-745) - Aquatic life uses are fully supported based on macroinvertebrate community data.

A fish consumption advisory has been issued by the Department for mercury and includes the Savannah River within this watershed (see advisory p.107).

NPDES Program

Active NPDES Facilities

RECEIVING STREAM	***NPDES#***
FACILITY NAME	***TYPE***
PERMITTED FLOW @ PIPE (MGD)	***COMMENT***

SAVANNAH RIVER TOWN OF ALLENDALE WWTP PIPE #: 001 FLOW: 4.0	SC0039918 MAJOR DOMESTIC
SAVANNAH RIVER CLAIRIANT CORP./MARTIN PLT PIPE #: 001 FLOW: 1.84	SC0042803 MINOR INDUSTRIAL

Growth Potential

There is a low potential for growth in this watershed, which is located near the Town of Allendale. Due to growth in the Allendale-Fairfax area, the Town of Allendale's treatment facility has been expanded.

03060107-010

(Stevens Creek)

General Description

Watershed 03060107-010 is located in Greenwood and McCormick Counties and consists primarily of ***Stevens Creek*** and its tributaries from its origin to Turkey Creek. The watershed occupies 159,118 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Cecil-Tatum-Herndon-Georgeville-Helena series. The erodibility of the soil (K) averages 0.33, and the slope of the terrain averages 7%, with a range of 2-25%. Land use/land cover in the watershed includes: 79.9% forested land, 10.5% agricultural land, 7.4% barren land, 1.8% urban land, 0.2% forested wetland, and 0.2% water.

Hard Labor Creek originates within the City of Greenwood and accepts drainage from Panola Branch (Oregon Pond), Muskrat Pond Branch, Armstrong Branch, Big Cowhead Creek (Little Cowhead Creek), Beaverdam Branch, Coleman Branch, Chiles Branch (Stillhouse Branch), Cunning Ford Creek (Church Branch), Brissey Branch, Calabash Branch (Goatneck Branch), Big Branch, Hibbler Branch, Buncombe Branch, Bracknell Branch, and Blue Branch. Cuffytown Creek originates near the City of Greenwood and accepts drainage from Horsepen Creek, Beaverdam Creek, Reedy Creek, Little Horsepen Creek, Little Creek, Mill Branch, Sand Branch, Cow Branch, Sandhill Branch, Lick Creek, Hill Branch, Doctors Branch, and Big Tree Branch. Hard Labor Creek and Cuffytown Creek merge to form Stevens Creek, which accepts drainage from Deal Branch, Rocky Creek (Persimmon Branch), and Byrd Creek. There are a total of 323.8 stream miles and 42.9 acres of lake waters in this watershed, all classified FW.

Surface Water Quality

Station #	Type	Class	Description
SV-151	P/BIO	FW	HARD LABOR CREEK AT S-24-164 BRIDGE
SV-731	BIO	FW	HARD LABOR CREEK AT S-33-23
SV-351	W/BIO	FW	CUFFYTOWN CREEK AT S-33-138
SV-730	BIO	FW	ROCKY CREEK AT S-33-87
SV-330	W	FW	STEVENS CREEK AT S-33-21

Hard Labor Creek - There are two monitoring sites along Hard Labor Creek. Aquatic life uses are partially supported at the upstream site ***(SV-151)*** based on macroinvertebrate community data. There is a significant decreasing trend in pH. Significant decreasing trends in five-day biochemical oxygen demand, turbidity, and total phosphorus concentration suggest improving conditions for these parameters. Recreational uses are not supported at this site due to fecal coliform bacteria excursions; however, a significant decreasing trend in fecal coliform bacteria concentration suggests improving conditions for this parameter. At the downstream site ***(SV-731),*** aquatic life uses are fully supported based on macroinvertebrate community data.

Cuffytown Creek (SV-351) – Aquatic life uses are fully supported based on macroinvertebrate community data; however, there were dissolved oxygen excursions. Recreational uses are partially supported due to fecal coliform bacteria excursions.

***Rocky Creek (SV-730)* –** Aquatic life uses are partially supported based on macroinvertebrate community data.

***Stevens Creek (SV-330)* –** Aquatic life uses are fully supported; however, there is a significant decreasing trend in dissolved oxygen concentration. Significant decreasing trends in five-day biochemical oxygen demand and total phosphorus concentration suggest improving conditions for these parameters. Recreational uses are fully supported.

Groundwater Quality

Well #	Class	Aquifer	Location
AMB-107	GB	PIEDMONT BEDROCK	N.W. EDGEVILLE COUNTY

All water samples collected from ambient monitoring well ***AMB-107*** met standards for Class GB groundwater.

NPDES Program

Active NPDES Facilities

RECEIVING STREAM ***FACILITY NAME*** ***PERMITTED FLOW @ PIPE (MGD)***	***NPDES#*** ***TYPE*** ***COMMENT***
HARD LABOR CREEK CITY OF GREENWOOD/W. ALEXANDER WWTP PIPE #: 001 FLOW: 2.2	SC0022870 MAJOR DOMESTIC
HARD LABOR CREEK MEDICAL TEXTILES INC. PIPE #: 001 FLOW: M/R	SCG250065 MINOR INDUSTRIAL
PANOLA BRANCH GREENWOOD MILLS/MATTHEWS PLT PIPE #: 001 FLOW: M/R	SCG250127 MINOR INDUSTRIAL
MUSKRAT POND BRANCH GREENWOOD MILLS/DURST PLT PIPE #: 001, 002 FLOW: M/R	SCG250124 MINOR INDUSTRIAL
MUSKRAT POND BRANCH GREENWOOD MILLS/CHALMERS PLT PIPE #: 001, 002, 003 FLOW: M/R	SCG250125 MINOR INDUSTRIAL
OREGON POND GREENWOOD MILLS/MATTHEWS PLT PIPE #: 002, 003 FLOW: M/R	SCG250127 MINOR INDUSTRIAL
PERSIMMON BRANCH MCCORMICK CPW/WTP PIPE #: 001 FLOW: M/R	SCG645007 MINOR INDUSTRIAL

PERSIMMON BRANCH TRIBUTARY MILLIKEN & CO./MCCORMICK PLT PIPE #: 001 FLOW: M/R	SC0000396 MAJOR INDUSTRIAL
ROCKY CREEK MCCORMICK ROCKY CREEK WWTF PIPE #: 001 FLOW: 0.85	SC0030783 MINOR DOMESTIC

Nonpoint Source Management Program

Mining Activities

MINING COMPANY ***MINE NAME***	***PERMIT #*** ***MINERAL***
SAVANNAH RIVER QUARRIES, INC. QUARRY #1	1271-65 GRANITE
GS ROOFING PRODUCTS CO., INC. PLUM BRANCH QUARRY	0998-65 METAANDESITE

Water Quantity

WATER USER ***STREAM***	***TOTAL PUMP. CAPACITY (MGD)*** ***RATED PUMP. CAPACITY (MGD)***
MCCORMICK CPW ROCKY CREEK	0.5 0.5

Growth Potential

There is a low to moderate potential for growth in this watershed, which contains portions of the Towns of Promised Land, Bradley, Troy, McCormick, Plum Branch, and Parksville, and a portion of the City of Greenwood. The Town of McCormick has experienced a population growth with the establishment of a State Prison near the town. Growth has occurred around the Savannah Lakes Village Development, a retirement village, on Lake Thurmond, and may encourage more in the future. The Greenwood Industrial Park, just south of the City of Greenwood, is considered a source of potential industrial growth. The midsection of the watershed resides within the Sumter National Forest and would tend to limit growth in that area.

03060107-020

(Turkey Creek)

General Description

Watershed 03060107-020 is located in Greenwood, McCormick, Edgefield, and Saluda Counties and consists primarily of ***Turkey Creek*** and its tributaries. The watershed occupies 154,607 acres of the Piedmont and Upper Coastal regions of South Carolina. The predominant soil types consist of an association of the Herndon-Tatum-Georgeville series. The erodibility of the soil (K) averages 0.35, and the slope of the terrain averages 7%, with a range of 2-25%. Land use/land cover in the watershed includes: 76.6% forested land, 12.3% barren land, 9.7% agricultural land, 0.7% forested wetland, 0.4% urban land, 0.2% water, and 0.1% nonforested wetland.

Turkey Creek originates near the Town of Johnston and accepts drainage from Little Turkey Creek (Bartley Branch),Center Spring Branch, Little Stevens Creek (Rocky Creek), and Sleepy Creek (Flat Rock Branch, Ephriam Branch). Talbert Branch and Mt. Carmel Branch join to form Mountain Creek, which accepts drainage from Catholic Branch, Pickell Branch, Little Mountain Creek, Bell Branch (Quaker Branch), and Hegwood Branch before draining into Turkey Creek. Log Creek (Dunn Creek) enters Turkey Creek next, followed by Jim Branch, Crooked Run, and Rocky Creek (Wiley Branch, Stockman Branch, Wilson Branch, Cartledge Branch, Bailey Branch). Further downstream, Turkey Creek accepts drainage from Pike Branch, Horse Branch, Broadwater Branch, Cyper Creek, Goff Branch, Wine Creek (Church Branch, Mack Branch), the Beaverdam Creek watershed, Coon Creek, Rock Creek, and Blue Branch. Turkey Creek drains into Stevens Creek. There are a total of 325.8 stream miles and 250.6 acres of lake waters in this watershed, all classified FW. The Sumter National Forest extends over a large portion of the watershed.

Surface Water Quality

Station #	Type	Class	Description
SV-729	BIO	FW	TURKEY CREEK AT S-191-100
SV-728	BIO	FW	LOG CREEK AT S-19-315
SV-727	BIO	FW	ROCKY CREEK AT S-19-61
SV-352	W	FW	TURKEY CREEK AT S-33-227/S-19-68

Log Creek (SV-728) – Aquatic life uses are fully supported based on macroinvertebrate community data.

Rocky Creek (SV-727) – Aquatic life uses are fully supported based on macroinvertebrate community data.

Turkey Creek – There are two monitoring sites along Turkey Creek. At the upstream site ***(SV-729),*** aquatic life uses are fully supported based on macroinvertebrate community data. At the downstream site ***(SV-352)***, aquatic life and recreational uses are fully supported.

Nonpoint Source Management Program

Land Disposal Activities

Landfill Facilities

LANDFILL NAME	***PERMIT #***
FACILITY TYPE	***STATUS***
EDGEFIELD COUNTY SANITARY LANDFILL	DWP-040 (SCD001409002)
DOMESTIC	INACTIVE
TRI-COUNTY LANDFILL	DWP-109; 194200-6001; 194200-1601
DOMESTIC	INACTIVE
TRI-COUNTY LANDFILL	194200-1201
C & D	INACTIVE

Mining Activities

MINING COMPANY	***PERMIT #***
MINE NAME	***MINERAL***
BORAL BRICK INC./MERRY DIV.	0040-37
EDGEFIELD SHALE PIT	SHALE

Growth Potential

There is a low to moderate potential for growth in this watershed, which contains portions of the Towns of Johnston and Edgefield. The Edgefield County Water and Sewer Authority's Regional Sewer Collection System now serves Edgefield County, and the Saluda County and the Town of Saluda where it connects to the sewer system of the City of North Augusta for final connection to the Horse Creek Valley WWTP. The Town of Johnson has also tied into the system, allowing for possible growth. A new industrial park has been proposed for the Town of Johnston between Hwy 23 and Hwy 121, and if built, would greatly increase industrial growth in this watershed. A new federal prison and state prison have been constructed in Edgefield County, which should also increase growth. Approximately half of the watershed resides within the Sumter National Forest and would tend to limit growth in that area.

03060107-030

(Beaverdam Creek)

General Description

Watershed 03060107-030 extends through Edgefield County and consists primarily of ***Beaverdam Creek*** and its tributaries. The watershed occupies 27,920 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Cecil-Tatum-Herndon-Georgeville series. The erodibility of the soil (K) averages 0.31, and the slope of the terrain averages 7%, with a range of 2-25%. Land use/land cover in the watershed includes: 81.7% forested land, 8.0% agricultural land, 6.0% barren land, 2.8% urban land, 0.8% forested wetland, 0.6% water, and 0.1% nonforested wetland.

Beaverdam Creek originates near the Town of Edgefield and accepts drainage from Slade Lake, Little Beaverdam Creek, Chap Branch, White Branch, Moss Branch, Camp Branch, and Red Hill Spring Branch. Beaverdam Creek drains into Turkey Creek. There are a total of 51.1 stream miles and 136.2 acres of lake waters within this watershed, all classified FW. The Sumter National Forest extends over the base of the watershed.

Surface Water Quality

Station #	Type	Class	Description
SV-068	S	FW	BEAVERDAM CREEK AT S-19-35, 3.8 MI NW OF EDGEFIELD
SV-353	W/BIO	FW	BEAVERDAM CREEK AT FOREST SERVICE RD 621 OFF S-19-68

Beaverdam Creek - There are two monitoring sites along Beaverdam Creek, and recreational uses are fully supported at **both sites**. Aquatic life use is fully supported at the upstream site ***(SV-068)***. There is a significant decreasing trend in pH. A significant decreasing trend in five-day biochemical oxygen demand suggests improving conditions for this parameter. At the downstream site ***(SV-353),*** aquatic life uses are fully supported based on macroinvertebrate community, physical, and chemical data.

NPDES Program

Active NPDES Facilities

RECEIVING STREAM FACILITY NAME PERMITTED FLOW @ PIPE (MGD)	NPDES# TYPE COMMENT
BEAVERDAM CREEK ECW&SA/BROOKS AVE PLT PIPE #: 001 FLOW: 0.725	SC0025330 MINOR DOMESTIC
BEAVERDAM CREEK FED PACIFIC ELECTRIC CO./ODELL DAM PIPE #: 001 FLOW: 0.00325	SC0047813 MINOR INDUSTRIAL
BEAVERDAM CREEK DELTA APPAREL/RAINSFORD PLT.	SCG250156 MINOR INDUSTRIAL

PIPE #: 001   FLOW: M/R

Growth Potential

There is a low to moderate potential for growth in this watershed, which contains a portion of the Town of Edgefield. The Edgefield Industrial Park, located southeast of the Town of Edgefield, is supported by a rail system and serves as a source of potential industrial growth in the watershed. The Edgefield County Water and Sewer Authority's Regional Sewer Collection System now serves Edgefield County, and the Saluda County and the Town of Saluda where it connects to the sewer system of the City of North Augusta for final connection to the Horse Creek Valley WWTP. The Town of Edgefield has connected to the system, allowing for possible growth. A new federal prison and state prison have been constructed in Edgefield County, which should also increase growth. A third of the watershed resides within the Sumter National Forest and would tend to limit growth in that area.

03060107-040

(Stevens Creek)

General Description

Watershed 03060107-040 is located in Edgefield and McCormick Counties and consists primarily of ***Stevens Creek*** and its tributaries from Turkey Creek to its confluence with the Savannah River. The watershed occupies 131,490 acres of the Piedmont and Upper Coastal Plain regions of South Carolina. The predominant soil types consist of an association of the Cecil-Hiwassee-Lakeland series. The erodibility of the soil (K) averages 0.24, and the slope of the terrain averages 9%, with a range of 0-25%. Land use/land cover in the watershed includes: 83.0% forested land, 9.4% barren land, 5.3% agricultural land, 1.2% forested wetland, 0.7% water, and 0.4% urban land.

This segment of Stevens Creek accepts drainage from Buzzard Branch, Cuffey Branch, Key Branch, Shumate Branch, another Buzzard Branch, John Branch, Lloyd Creek (Owl Branch), and Horn Creek. Horn Creek accepts drainage from Quarles Creek (Clearwater Branch), Gilroy Branch, Tobler Creek, Hog Eye Branch, Cedar Creek, Rock Creek, Dry Creek, Lick Fork (Lick Fork Lake, Miller Branch, Big Branch), Big Creek, and Williams Branch. Downstream of Horn Creek, Stevens Creek accepts drainage from Reedy Branch, Cheves Creek (Canaan Branch, Spring Branch, Monday Branch, Bakers Branch, Burkhalter Branch, Big Branch, Dry Branch, Rainsford Pond), Anderson Branch, Hardy Branch, and Sweetwater Branch. There are a total of 261.9 stream miles and 245.1 acres of lake waters within this watershed, all classified FW. The Sumter National Forest extends over the western side of the watershed.

Surface Water Quality

Station #	Type	Class	Description
SV-063	BIO	FW	STEVENS CREEK AT SC 23
SV-354	W	FW	STEVENS CREEK AT S-33-88/S-19-143
SV-726	BIO	FW	HORN CREEK AT S-19-143
SV-725	BIO	FW	CHEVES CREEK AT S-19-34

Stevens Creek* -** There are two monitoring sites along Stevens Creek in this watershed. At the upstream site ***(SV-063), aquatic life uses are fully supported based on macroinvertebrate community data. At the downstream site ***(SV-354),*** aquatic life and recreational uses are fully supported.

Horn Creek (SV-726) - Aquatic life uses are fully supported based on macroinvertebrate community data.

Cheves Creek (SV-725) - Aquatic life uses are fully supported based on macroinvertebrate community data.

Natural Swimming Areas

FACILITY NAME / ***RECEIVING STREAM***	***PERMIT #*** / ***STATUS***
LICK FORK LAKE	19-1001N
LICK FORK LAKE	ACTIVE

NPDES Program

Active NPDES Facilities

RECEIVING STREAM ***FACILITY NAME*** ***PERMITTED FLOW @ PIPE (MGD)***	***NPDES#*** ***TYPE*** ***COMMENT***
CHEVES CREEK TRIBUTARY ECW&SA/LAND-O-LAKES SD PIPE #: 001 FLOW: 0.015	SC0032492 MINOR DOMESTIC
SWEETWATER BRANCH BP OIL INC./SWEETWATERTERMINAL PIPE #: 001 FLOW: M/R	SCG340004 MINOR INDUSTRIAL
SWEETWATER BRANCH WILLIAMS TERMINALS HOLD/N. AUGUSTA PIPE #: 001 FLOW: M/R	SCG340012 MINOR INDUSTRIAL
SWEETWATER BRANCH WILLIAMS TERMINALS HOLD/N. AUGUSTA PIPE #: 001 FLOW: M/R	SCG340003 MINOR INDUSTRIAL

Nonpoint Source Management Program

Land Disposal Activities

Landfill Facilities

LANDFILL NAME ***FACILITY TYPE***	***PERMIT #*** ***STATUS***
GRIFFIN SHORT TERM C & D LANDFILL C & D	332900-1301 CLOSED

Growth Potential

There is a low potential for growth in this watershed, which contains portions of the Towns of Modoc, Clarks Hill, Murphys Estates, and Edgefield. The Edgefield Industrial Park, located southeast of the Town of Edgefield, is supported by a rail system and serves as a source of potential industrial growth in the watershed. The Edgefield County Water and Sewer Authority's Regional Sewer Collection System now serves Edgefield County, and the Saluda County and the Town of Saluda where it connects to the sewer system of the City of North Augusta for final connection to the Horse Creek Valley WWTP. The Town of Edgefield has connected to the system, allowing for possible growth. A new federal prison and state prison have been constructed in Edgefield County, which should also increase growth. The growth of North Augusta is approaching the Stevens Creek area, particularly residential development. The regional sewer line should also enhance industrial development along U.S. Hwy 25, between the Towns of Trenton and North Augusta. Over half of the watershed resides within the Sumter National Forest and would tend to limit growth in that area.

03060109-020

(Savannah River)

General Description

Watershed 03060109-020 is located in Allendale and Hampton Counties and consists primarily of the ***Savannah River*** and its tributaries from the Brier Creek Landing to Boggy Branch. The watershed occupies 91,027 acres of the Lower Coastal Plain region of South Carolina. The predominant soil types consist of an association of the Chastain-Rains-Argent-Norfolk-Tawcaw series. The erodibility of the soil (K) averages 0.21, and the slope of the terrain averages 1%, with a range of 0-6%. Land use/land cover in the watershed includes: 42.2% forested land, 30.5% forested wetland, 21.6% agricultural land, 4.3% barren land, 0.9% water, 0.4% nonforested wetland, and 0.1% urban land.

This section of the Savannah River accepts drainage from its upper reaches (03060103 and 03060106), together with Buck Creek*, Cutoff No.10, Ware Creek, Cutoff No. 9, Clear Water Creek (Dry Ball Branch, Long Branch, Ceasars Camp Pond, Gaylord Crossing Pond, Bob Bee Tree Lake, Blake Lake, Barnes Lake, Ball Lake), and Pike Creek (Rose Bowl Pond, Long Pond, Heart Stone Pond, Calhoun Pond, Big Lake). Cornhouse Reach and Little Cornhouse Reach enter the system next, followed by Wildcat Cut, Black Creek*, Ferry Branch*, Hudson Ferry Reach, Fowl Craw Lake, and Jordan Lake. Boggy Branch (Millpond Branch, McKenzie Pond, Boggy Swamp, King Branch, Dunn Pond, Flat Lake, Bluff Lake) enters the river at the base of the watershed. An asterisk connotes a stream entering from the Georgia side of the river. There are a total of 139.8 stream miles and 484.7 acres of lake waters within the South Carolina portion of the watershed, all classified FW.

Surface Water Quality

There are no water quality monitoring stations in this watershed.

A fish consumption advisory has been issued by the Department for mercury and includes the Savannah River within this watershed (see advisory p.116).

Growth Potential

There is a low potential for growth in this watershed, which contains a portion of the Town of Scotia.

03060109-050

(Savannah River)

General Description

Watershed 03060109-050 is located in Hampton and Jasper Counties and consists primarily of the ***Savannah River*** and its tributaries from Boggy Branch to Ebenezer Creek, Georgia. The watershed occupies 24,300 acres of the Lower Coastal Plain and Coastal Zone regions of South Carolina. The predominant soil types consist of an association of the Argent-Rains series. The erodibility of the soil (K) averages 0.20, and the slope of the terrain averages 1%, with a range of 0-2%. Land use/land cover in the watershed includes: 45.2% forested land, 42.6% forested wetland, 6.5% agricultural land, 3.6% barren land, 1.2% water, 0.7% nonforested wetland, and 0.2% urban land.

This section of the Savannah River accepts drainage from its upper reaches (03060103, 03060106, 03060109-020), together with Hog Branch, Church Branch, Cutoff No.7A, Sisters Cut, Little Snooks Slake, Snooks Lake, Ivory Lake, Strong Creek, Yorkley Creek, and Ebenezer Creek*. An asterisk connotes a stream entering from the Georgia side of the river. There are a total of 60.7 stream miles and 10.8 acres of lake waters within the South Carolina portion of the watershed, all classified FW.

Surface Water Quality

Station #	Type	Class	Description
SV-355	W	FW	SAVANNAH RIVER AT STOKES BLUFF LANDING OFF S-25-461

Savannah River (SV-355) - Aquatic life and recreational uses are fully supported at this site.

A fish consumption advisory has been issued by the Department for mercury and includes the Savannah River within this watershed (see advisory p.116).

Growth Potential

There is a low potential for growth in this watershed.

03060109-060

(Savannah River)

General Description

Watershed 03060109-060 is located in Hampton and Jasper Counties and consists primarily of the ***Savannah River*** and its tributaries from Ebenezer Creek (in Georgia) to the Atlantic Ocean. The watershed occupies 117,041 acres of the Coastal Zone region of South Carolina. The predominant soil types consist of an association of the Santee-Lynchburg-Goldsboro-Bohicket-Argent series. The erodibility of the soil (K) averages 0.13, and the slope of the terrain averages 1%, with a range of 0-2%. Land use/land cover in the watershed includes: 39.4% forested wetland, 31.1% forested land, 12.0% agricultural land, 8.0% nonforested wetland, 4.7% water, 4.1% barren land, and 0.7% urban land.

This section of the Savannah River accepts drainage from its upper reaches (03060103, 03060106, 03060109-020, -050). Black Swamp accepts drainage from Long Branch, Cypress Branch, Big Boar Flat, Tew Lake, Cypress Creek, Umber Run*, Hodgins Lake, Chunk Creek, Tee Lake, Coleman Run, Ebenezer Creek*, Lockner Creek*, and Mill Creek*. An asterisk connotes a stream entering from the Georgia side of the river. Bear Creek* enters the river next, followed by Gator Holes, Coleman Lake, Far Lake, Meyer Lake, Big Collins Lake, and Abercorn Creek*.

Downstream of Abercorn Creek, McCoys Cut connects the Savannah River (now in Georgia) to the Little Back River (now the stateline). The Little Back River accepts drainage from Union Creek, Vernezobre Creek, and Clydesdale Creek before flowing into the Back River. The Middle River flows between the Savannah River and the Back River, with connections to both. Shubra Canal, Clydesdale Canal, and Murray Hill Canal drain into the Back River before it merges back into the Savannah River (again the stateline). South Channel* breaks out at the confluence and flows parallel to the Savannah River to the ocean. Elba Island Cut* connects South Channel to the Savannah River, and Fields Cut or the Mud River connects the Savannah River to the Wright River in the New River watershed. The Savannah River is Class SB* (DO not less than daily average 5 mg/l and minimum 4 mg/l) from the Seaboard Coastline Railroad to Ft. Pulaski, and Class SA from Ft. Pulaski to the Atlantic Ocean. The remainder of the watershed is FW. There are a total of 149.5 stream miles and 49.5 acres of lake waters, and 3,356 acres of estuarine areas within the South Carolina portion of the watershed.

Surface Water Quality

Station #	Type	Class	Description
SV-744	BIO	FW	CYPRESS BRANCH AT US 321
SV-356	W	FW	CYPRESS CREEK AT S-27-119
SV-191	P	SB*	SAVANNAH RIVER AT US 17, 8.9MI SSW OF HARDEEVILLE

Cypress Branch (SV-744) - Aquatic life uses are fully supported based on macroinvertebrate community data.

Cypress Creek (SV-356) - Aquatic life uses are not supported due to dissolved oxygen excursions. Although pH excursions occurred, they are typical of values seen in blackwater systems and are considered natural, not standards violations. Recreational uses are fully supported.

Savannah River (SV-191) - Aquatic life uses are fully supported. This is a tidally influenced system with marsh drainage, characterized by naturally low pH and dissolved oxygen concentration. Although pH and dissolved oxygen excursions were noted, they were typical of values seen in such systems and are considered natural, not standards violations. There is a significant increasing trend in pH. A significant decreasing trend in five-day biochemical oxygen demand and total nitrogen concentration suggest improving conditions for these parameters. Recreational uses are partially supported due to fecal coliform bacteria excursions.

A fish consumption advisory has been issued by the Department for mercury and includes the Savannah River within this watershed (see advisory p.116).

Groundwater Quality

Well #	Class	Aquifer	Location
AMB-097	GB	TERTIARY LIMESTONE	HARDEEVILLE

All water samples collected from ambient monitoring well ***AMB-097*** met standards for Class GB groundwater.

NPDES Program

Active NPDES Facilities

RECEIVING STREAM ***FACILITY NAME*** ***PERMITTED FLOW @ PIPE (MGD)***	***NPDES#*** ***TYPE*** ***COMMENT***
SAVANNAH RIVER BJW&SA/HARDEEVILLE CHURCH ROAD PIPE #: 001 FLOW: 1.01	SC0034584 MAJOR DOMESTIC
BLACK SWAMP TO SAVANNAH RIVER YOUMANS FISH PONDS PIPE #: 001 FLOW: 0.5	SCG130004 MINOR INDUSTRIAL

Nonpoint Source Management Program

Mining Activities

MINING COMPANY ***MINE NAME***	***PERMIT #*** ***MINERAL***
COASTAL SAND INC. KEIFFER MINES	1075-53 SAND
MALPHRUS CONSTRUCTION CO. NEW HARDEEVILLE MINE	1251-53 SAND
MALPHRUS CONSTRUCTION CO. OAKWOOD MINE	1231-53 SAND/CLAY

MALPHRUS CONSTRUCTION CO.	1254-53
2930 LAKE	SAND/CLAY

Water Quantity

WATER USER	***TOTAL PUMP. CAPACITY (MGD)***
STREAM	***RATED PUMP. CAPACITY (MGD)***
BJWSA	40.2
SAVANNAH RIVER	31.2

Growth Potential

There is a moderate potential for growth in this watershed, primarily in the vicinity of the Town of Hardeeville. The proposed siting of the DaimlerChrysler van plant across the Savannah River from Hardeeville should also provide residential and commercial growth to the area. Portions of the Towns of Scotia and Furman are located at the top of the watershed, where there is a lower potential for growth. Beaufort-Jasper Water and Sewer Authority is in the process of expanding the wastewater treatment facility, which should promote future growth. Less than 25% of the total land area is suitable for septic system installations; and another 25% or less is classified as marginally suitable. Also, growth in the area tends to be spread out over a large area not served by a sewer system. The Savannah National Wildlife Preserve and the Tybee Island National Wildlife Preserve are located at the base of this watershed, and would limit growth in these areas.

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APPENDIX A.

Watershed Boundary Changes

Watershed Boundary Changes

SCDHEC Geographic Features		Original 11-digit HU Code	Revised 11-digit HU Code
Water Quality Monitoring Stations			
SV-337		03060101-020	03060101-010
SV-336		03060101-020	03060101-010
SV-322		03060101-040	03060101-080
SV-236		03060101-040	03060101-080
SV-199		03060102-060	03060102-010
SV-357		03060103-030	03060103-070
CL-039		03060103-100	03060103-140
SV-294		03060103-100	03060106-030
Biological Monitoring Stations			
SV-684		03060101-050	03060101-050
SV-199		03060102-060	03060102-010
RS-01049		03060106-140	03060103-140
NPDES	**Pipe #**		
SCG645032	001	03060102-120	03060102-130
SC0000299	001	03060103-030	03060103-070
SC0000299	002	03060103-030	03060103-070
SC0024457	001	03060106-060	03060106-050
Landfills			
IWP-193		03060101-020	03060101-010
373303-1602		03060101-020	03060101-010
371001-6001		03060101-040	03060101-080
DWP-041		03060101-040	03060101-080
371001-1201		03060101-040	03060101-080

APPENDIX B.

Tugaloo River/Seneca River Basin

Ambient Water Quality Monitoring Site Descriptions

Station #	Type	Class	Description
03060102-010			
SV-308	S/BIO	ORW	EAST FORK CHATTOOGA RIVER AT SC 107, 2 MI S OF STATE LINE
SV-792	BIO	ORW	EAST FORK CHATTOOGA RIVER 300 MI DOWNSTREAM OF HATCHERY OUTFALL
SV-227	P/BIO	ORW	CHATTOOGA RIVER AT SC 28 3.5 MI NW MT REST
SV-199	P	ORW	CHATTOOGA RIVER AT US 76
SV-359	W	FW	TUGALOO LAKE, FOREBAY EQIDISTANT FROM SPILLWAY AND SHORELINE
03060102-060			
SV-358	W	FW	LAKE YONAH, ½ WAY BETW. CENTER OF SPILLWAY AND OPPOSITE SHORE
SV-673	BIO	FW	BRASSTOWN CREEK AT S-37-48
SV-200	S	FW	TUGALOO RIVER ARM OF LAKE HARTWELL AT US 123
03060102-120			
SV-675	BIO	ORW	CHAUGA RIVER AT S-37-193
SV-344	W	FW	CHAUGA RIVER AT S-37-34
SV-225	BIO	FW	TOXAWAY CREEK AT S-37-34
03060102-130			
SV-301	S	FW	NORRIS CREEK AT S-37-435, 1 MI S OF WESTMINSTER
SV-108	W/BIO	FW	CHOESTOEA CREEK AT S-37-49
SV-345	W/BIO	FW	BEAVERDAM CREEK AT S-37-66
03060101-010			
SV-335	P	TPGT	LAKE JOCASSEE AT TOXAWAY R., HORSEPASTURE R. & LAUREL FK CK CONFL.
SV-334	P	TPGT	LAKE JOCASSEE, MAIN BODY
SV-337	P	TPGT	LAKE JOCASSEE OUTSIDE COFFER DAM AT BAD CREEK PROJECT
SV-336	P	TPGT	LAKE JOCASSEE AT THOMPSON RIVER & WHITEWATER RIVER CONFLUENCE..
03060101-030			
SV-741	BIO	ORW	EASTATOE CREEK AT S-39-237
SV-676	BIO	ORW	ROCKY BOTTOM CREEK AT US 178
SV-230	P/BIO	TPGT	EASTATOE CREEK AT S-39-143
SV-341	W/BIO	TPGT	LITTLE EASTATOE CREEK AT S-39-49
SV-338	P	FW	LAKE KEOWEE ABOVE SC 130 AND DAM
03060101-040			
SV-249	P	FW	LAKE HARTWELL HEADWATERS, KEOWEE RIVER ARM AT SC 183
SV-205	W/BIO	FW	SIXMILE CREEK AT S-39-160
SV-683	BIO	FW	WILDCAT CREEK AT CLEMSON UNIV. REC. AREA OFF SC 133
SV-360	W	FW	LAKE ISSAQUEENA, FOREBAY EQUIDISTANT FROM DAM AND SHORELINE
SV-106	S	FW	MARTIN CREEK ARM OF LAKE HARTWELL AT S-37-65 N OF CLEMSON
SV-288	P	FW	L. HARTWELL, SENECA R. ARM AT USACE BUOY BETW MRKRS S-28A & S-29
SV-180	BIO	FW	SIX AND TWENTY CREEK AT S-04-174
SV-181	S	FW	SIX AND TWENTY CREEK AT S-04-29, 8.2 MI SE OF PENDLETON
SV-339	P	FW	LAKE HARTWELL, SENECA R. ARM AT USACE BUOY BETW MRKRS S-14 & S-15
03060101-050			
SV-684	BIO	FW	CRANE CREEK AT WINDING STAIRS RD
SV-743	BIO	FW	FLAT SHOALS RIVER AT S-37-129
SV-742	BIO	FW	OCONEE CREEK AT S-37-129
SV-203	S	FW	LITTLE RIVER AT S-37-24 7.1 MI NE OF WALHALLA
SV-312	P	FW	LAKE KEOWEE AT SC 188 – CROOKED CK ARM 4.5 MI N SENECA
Station #	**Type**	**Class**	**Description**

03060101-050 (Continued)

SV-343	W/BIO	FW	Little Cane Creek at S-37-133
SV-342	W/BIO	FW	Cane Creek at S-37-133
SV-311	P	FW	Lake Keowee at SC 188 – Cane Ck arm 3.5 mi NW Seneca

03060101-060

SV-206	S/BIO	FW	North Fork at US 178, 2.9 mi N of Pickens
SV-282	SED	FW	Twelvemile Creek at S-39-273, 2.8 mi SSW of Pickens
SV-740	BIO	FW	Rices Creek at S-39-158
SV-739	BIO	FW	Twelvemile Creek at S-39-137

03060101-070

SV-239	S	FW	Golden Creek at S-39-222, 1.2 mi NW of Liberty
SV-738	BIO	FW	Golden Creek at Golden Creek Road
SV-015	P	FW	Twelvemile Creek at S-39-51, N of Norris
SV-137	P	FW	Twelvemile Creek at S-39-337
SV-136	S	FW	1st unnamed creek after leaving Central at CLVT on Maw Bridge Rd
SV-107	P	FW	Twelvemile Creek Arm of Lake Hartwell at SC 133

03060101-080

SV-333	P	FW	Coneross Creek at S-37-13
SV-004	P	FW	Coneross Creek at SC 59
SV-236	P	FW	Coneross Ck Arm of Lake Hartwell at S-37-184, 6.5 mi SSE of Seneca

03060101-090

SV-017	S	FW	Eighteenmile Creek at unnumbered county rd, 2.25 mi SSW of Easley
SV-241	S	FW	Woodside Branch at US 123, 1.5 mi E of Liberty
SV-245	S	FW	Eighteenmile Creek at S-39-27, 3.3 mi S of Liberty
SV-135	P/BIO	FW	Eighteenmile Creek at S-39-93, S of Central
SV-268	P	FW	Eighteenmile Creek at 2-04-1098

03060101-100

SV-735	BIO	FW	Three and Twenty Creek at S-04-29
SV-111	S	FW	Three and Twenty Creek at S-04-280

For further details concerning sampling frequency and parameters sampled, please visit our website at *www.scdhec.gov/eqc/admin/html/eqcpubs.html#wqreports* for the current State of S.C. Monitoring Strategy.

Water Quality Data

Spreadsheet Legend

Station Information:

STATION NUMBER Station ID

TYPE SCDHEC station type code

P = Primary station, sampled monthly all year round

S = Secondary station, sampled monthly May - October

P* = Secondary station upgraded to primary station parameter coverage and sampling frequency for ba

W = Special watershed station added for the Savannah River Basin study

BIO = Indicates macroinvertebrate community data assessed

WATERBODY NAME Stream or Lake Name

CLASS Stream classification at the point where monitoring station is located

Parameter Abbreviations and Parameter Measurement Units:

DO	Dissolved Oxygen (mg/l)	NH3	Ammonia (mg/l)
BOD	Five-Day Biochemical Oxygen Demand (mg/l)	CD	Cadmium (ug/l)
pH	pH (SU)	CR	Chromium (ug/l)
TP	Total Phosphorus (mg/l)	CU	Copper (ug/l)
TN	Total Nitrogen (mg/l)	PB	Lead (ug/l)
TURB	Turbidity (NTU)	HG	Mercury (ug/l)
TSS	Total Suspended Solids (mg/l)	NI	Nickel (ug/l)
BACT	Fecal Coliform Bacteria (#/100 ml)	ZN	Zinc (ug/l)

Statistical Abbreviations:

N For standards compliance, number of surface samples collected between January 1996 and December 2000.
For trends, number of surface samples collected between January 1984 and December 2000.
For total phosphorus, an additional trend period of January 1992 to December 2000 is also reported.

EXC. Number of samples contravening the appropriate standard

% Percentage of samples contravening the appropriate standard

MEAN EXC. Mean of samples that contravened the applied standard

MED For heavy metals with a human health criterion, this is the median of all surface samples between January 1996 and December 2000. DL indicates that the median was the detection limit.

MAG Magnitude of any statistically significant trend, average change per year, expressed in parameter measurement units

GEO MEAN Geometric mean of fecal coliform bacteria samples collected between January 1996 and December 2000

Key to Trends:

D Statistically significant decreasing trend in parameter concentration

I Statistically significant increasing trend in parameter concentration

* No statistically significant trend

Blank Insufficient data to test for long term trends

TUGALOO RIVER/SENECA RIVER BASINS WATER QUALITY SUMMARY

STATION				DO	DO	DO	MEAN	TRENDS (86 -2000)					
NUMBER	TYPE	WATERBODY NAME	CLASS	N	EXC.	%	EXC.	DO	N	MAG	BOD	N	MAG
03060101010													
SV-337	P	LAKE JOCASSEE	TPGT	68	1	1	2.50	*	140	-0.020	D	111	-0.013
SV-336	P	LAKE JOCASSEE	TPGT	62	0	0		D	131	-0.026	D	111	-0.016
SV-335	P	LAKE JOCASSEE	TPGT	64	0	0		D	136	-0.028	D	114	-0.020
SV-334	P	LAKE JOCASSEE	TPGT	63	0	0		*	135	-0.011	D	116	-0.025
03060101030													
SV-741	BIO	EASTATOE CK	ORW										
SV-676	BIO	ROCKY BOTTOM CK	ORW										
SV-230	P/BIO	EASTATOE CK	TPGT	52	0	0		I	124	0.050	D	126	-0.025
SV-341	SS/BIO	LITTLE EASTATOE CK	TPGT	23	0	0							
SV-338	P	LAKE KEOWEE	FW	65	0	0		*	134	0.011	D	115	-0.033
03060101040													
SV-249	P	LAKE HARTWELL	FW	55	1	2	2.70	D	173	-0.033	D	172	-0.052
SV-205	SS/BIO	SIXMILE CK	FW	24	0	0							
SV-683	BIO	WILDCAT CK	FW										
SV-360	SS	LAKE ISSAQUEENA	FW	18	0	0							
SV-106	S	LAKE HARTWELL	FW	28	0	0		*	82	0.000	D	81	-0.049
SV-288	P	LAKE HARTWELL	FW	59	0	0		*	178	0.000	D	168	-0.056
SV-180	BIO	SIX & TWENTY CK	FW										
SV-181	S	SIX & TWENTY CK	FW	29	0	0		*	83	0.039	*	83	-0.013
SV-339	P	LAKE HARTWELL	FW	61	0	0		*	125	0.025	D	115	-0.049
03060101050													
SV-684	BIO	CRANE CK	FW										
SV-743	BIO	FLAT SHOALS RIVER	FW										
SV-742	BIO	OCONEE CK	FW										
SV-203	P*	LITTLE RVR	FW	41	1	2	3.05	*	96	0.008	*	96	0.000
SV-312	P	LAKE KEOWEE	FW	69	0	0		D	189	-0.025	D	170	-0.043
SV-343	SS/BIO	LITTLE CANE CK	FW	24	0	0							
SV-342	SS/BIO	CANE CK	FW	24	0	0							
SV-311	P	LAKE KEOWEE	FW	70	0	0		D	193	-0.022	D	170	-0.050
03060101060													
SV-206	S/BIO	NORTH FORK	FW	29	0	0		*	82	0.000	D	81	-0.045
SV-282		TWELVE MILE CK	FW										
SV-740	BIO	RICES CK	FW										
SV-739	BIO	TWELVE MILE CK	FW										

TUGALOO RIVER/SENECA RIVER BASINS WATER QUALITY SUMMARY

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	pH N	pH EXC.	pH %	MEAN EXC.	TRENDS (86-2000) PH	N	MAG	TURB N	TURB EXC.	TURB %	MEAN EXC.	TRENDS (86-2000) TURB	N	MAG
03060101010																	
SV-337	P	LAKE JOCASSEE	TPGT	66	2	3	6.535	I	134	0.046	51	1	2	11	D	113	-0.040
SV-336	P	LAKE JOCASSEE	TPGT	59	5	8	7.700	I	124	0.050	51	1	2	20	D	114	-0.033
SV-335	P	LAKE JOCASSEE	TPGT	62	5	8	8.156	I	131	0.034	50	0	0		*	115	0.000
SV-334	P	LAKE JOCASSEE	TPGT	61	2	3	8.165	I	128	0.042	52	0	0		D	116	-0.033
03060101030																	
SV-741	BIO	EASTATOE CK	ORW														
SV-676	BIO	ROCKY BOTTOM CK	ORW														
SV-230	P/BIO	EASTATOE CK	TPGT	54	1	2	8.02	I	125	0.043	54	7	13	33.1	D	126	-0.313
SV-341	SS/BIO	LITTLE EASTATOE CK	TPGT	23	0	0					23	3	13	90.7			
SV-338	P	LAKE KEOWEE	FW	65	2	3	8.890	I	131	0.045	51	0	0		D	114	-0.050
03060101040																	
SV-249	P	LAKE HARTWELL	FW	54	1	2	5.95	*	168	0.000	53	0	0		D	170	-0.067
SV-205	SS/BIO	SIXMILE CK	FW	24	0	0					24	3	13	183.3			
SV-683	BIO	WILDCAT CK	FW														
SV-360	SS	LAKE ISSAQUEENA	FW	18	2	11	8.650				18	0	0				
SV-106	S	LAKE HARTWELL	FW	29	0	0		*	82	-0.013	27	0	0		*	78	0.000
SV-288	P	LAKE HARTWELL	FW	59	1	2	5.90	I	175	0.016	47	0	0		D	164	-0.063
SV-180	BIO	SIX & TWENTY CK	FW														
SV-181	S	SIX & TWENTY CK	FW	30	0	0		*	84	0.000	29	0	0		I	82	0.500
SV-339	P	LAKE HARTWELL	FW	61	0	0		I	124	0.050	49	0	0		D	114	-0.071
03060101050																	
SV-684	BIO	CRANE CK	FW														
SV-743	BIO	FLAT SHOALS RIVER	FW														
SV-742	BIO	OCONEE CK	FW														
SV-203	P*	LITTLE RVR	FW	41	1	2	9.35	*	95	0.000	39	0	0		D	93	-0.217
SV-312	P	LAKE KEOWEE	FW	68	0	0		I	184	0.013	52	0	0		D	167	-0.066
SV-343	SS/BIO	LITTLE CANE CK	FW	24	0	0					24	1	4	60			
SV-342	SS/BIO	CANE CK	FW	24	0	0					24	2	8	110.0			
SV-311	P	LAKE KEOWEE	FW	69	0	0		*	187	0.007	53	0	0		D	168	-0.057
03060101060																	
SV-206	S/BIO	NORTH FORK	FW	29	1	3	9.34	I	81	0.019	28	0	0		I	80	0.300
SV-282		TWELVE MILE CK	FW														
SV-740	BIO	RICES CK	FW														
SV-739	BIO	TWELVE MILE CK	FW														

TUGALOO RIVER/SENECA RIVER BASINS WATER QUALITY SUMMARY

STATION				TP	TP	TP	MEAN	TRENDS (92-2000)			TRENDS (86-2000)		
NUMBER	TYPE	WATERBODY NAME	CLASS	N	EXC.	%	EXC.	TP	N	MAG	TP	N	MAG
	03060101010												
SV-337	P	LAKE JOCASSEE	TPGT	22	1	5	0.03	*	63	0.000	*	78	0.000
SV-336	P	LAKE JOCASSEE	TPGT	22	1	5	0.03	I	64	0.000	I	79	0.000
SV-335	P	LAKE JOCASSEE	TPGT	22	0	0		I	68	0.000	I	85	0.000
SV-334	P	LAKE JOCASSEE	TPGT	24	1	4	0.04	I	70	0.000	*	87	0.000
	03060101030												
SV-741	BIO	EASTATOE CK	ORW										
SV-676	BIO	ROCKY BOTTOM CK	ORW										
SV-230	P/BIO	EASTATOE CK	TPGT					*	67	0.001	*	93	0.000
SV-341	SS/BIO	LITTLE EASTATOE CK	TPGT										
SV-338	P	LAKE KEOWEE	FW	23	0	0		*	65	0.000	*	82	0.000
	03060101040												
SV-249	P	LAKE HARTWELL	FW	24	0	0		*	67	0.000	*	136	0.000
SV-205	SS/BIO	SIXMILE CK	FW										
SV-683	BIO	WILDCAT CK	FW										
SV-360	SS	LAKE ISSAQUEENA	FW	6	0	0							
SV-106	S	LAKE HARTWELL	FW	13	0	0		*	31	0.000	*	66	0.000
SV-288	P	LAKE HARTWELL	FW	22	0	0		*	70	0.000	D	132	0.000
SV-180	BIO	SIX & TWENTY CK	FW										
SV-181	S	SIX & TWENTY CK	FW					I	30	0.017	*	66	0.000
SV-339	P	LAKE HARTWELL	FW	23	0	0		I	69	0.000	*	87	0.000
	03060101050												
SV-684	BIO	CRANE CK	FW										
SV-743	BIO	FLAT SHOALS RIVER	FW										
SV-742	BIO	OCONEE CK	FW										
SV-203	P*	LITTLE RVR	FW					*	33	0.000	*	67	0.000
SV-312	P	LAKE KEOWEE	FW	25	0	0		I	67	0.000	*	138	0.000
SV-343	SS/BIO	LITTLE CANE CK	FW										
SV-342	SS/BIO	CANE CK	FW										
SV-311	P	LAKE KEOWEE	FW	23	0	0		I	66	0.000	*	136	0.000
	03060101060												
SV-206	S/BIO	NORTH FORK	FW								D	63	0.000
SV-282		TWELVE MILE CK	FW										
SV-740	BIO	RICES CK	FW										
SV-739	BIO	TWELVE MILE CK	FW										

TUGALOO RIVER/SENECA RIVER BASINS WATER QUALITY SUMMARY

STATION				TN	TN	TN	MEAN	TRENDS (86-2000)			CHL	CHL	CHL	MEAN	TRENDS (86-2000)		
NUMBER	TYPE	WATERBODY NAME	CLASS	N	EXC.	%	EXC.	TN	N	MAG	N	EXC.	%	EXC.	TSS	N	MAG
03060101010																	
SV-337	P	LAKE JOCASSEE	TPGT	49	1	2	0.51	*	106	0.000	24	0	0				
SV-336	P	LAKE JOCASSEE	TPGT	48	1	2	0.40	*	106	0.000	25	0	0				
SV-335	P	LAKE JOCASSEE	TPGT	47	2	4	0.600	*	111	0.000	25	0	0				
SV-334	P	LAKE JOCASSEE	TPGT	51	2	4	0.500	D	114	0.000	25	0	0				
03060101030																	
SV-741	BIO	EASTATOE CK	ORW														
SV-676	BIO	ROCKY BOTTOM CK	ORW														
SV-230	P/BIO	EASTATOE CK	TPGT					D	122	-0.005					D	102	-0.185
SV-341	SS/BIO	LITTLE EASTATOE CK	TPGT														
SV-338	P	LAKE KEOWEE	FW	46	0	0		D	105	-0.003	24	0	0				
03060101040																	
SV-249	P	LAKE HARTWELL	FW	51	0	0		D	162	-0.013							
SV-205	SS/BIO	SIXMILE CK	FW														
SV-683	BIO	WILDCAT CK	FW														
SV-360	SS	LAKE ISSAQUEENA	FW	18	0	0					12	0	0				
SV-106	S	LAKE HARTWELL	FW	2	0	0					3	0	0				
SV-288	P	LAKE HARTWELL	FW	46	0	0		D	154	-0.013	23	0	0				
SV-180	BIO	SIX & TWENTY CK	FW														
SV-181	S	SIX & TWENTY CK	FW														
SV-339	P	LAKE HARTWELL	FW	47	0	0		D	111	-0.008	23	0	0				
03060101050																	
SV-684	BIO	CRANE CK	FW														
SV-743	BIO	FLAT SHOALS RIVER	FW														
SV-742	BIO	OCONEE CK	FW														
SV-203	P*	LITTLE RVR	FW														
SV-312	P	LAKE KEOWEE	FW	52	0	0		D	166	-0.013	24	0	0				
SV-343	SS/BIO	LITTLE CANE CK	FW														
SV-342	SS/BIO	CANE CK	FW														
SV-311	P	LAKE KEOWEE	FW	47	0	0		D	160	-0.011	24	0	0				
03060101060																	
SV-206	S/BIO	NORTH FORK	FW														
SV-282		TWELVE MILE CK	FW														
SV-740	BIO	RICES CK	FW														
SV-739	BIO	TWELVE MILE CK	FW														

TUGALOO RIVER/SENECA RIVER BASINS WATER QUALITY SUMMARY

STATION				GEO	BACT	BACT	BACT	MEAN	TRENDS (86-2000)			NH3	NH3	NH3	CD	CD	CD	MEAN
NUMBER	TYPE	WATERBODY NAME	CLASS	MEAN	N	EXC.	%	EXC.	BACT	N	MAG	N	EXC.	%	N	EXC.	%	EXC.
03060101010																		
SV-337	P	LAKE JOCASSEE	TPGT	1	50	0	0		D	112	0.000	47	0	0	16	0	0	
SV-336	P	LAKE JOCASSEE	TPGT	1	50	0	0		D	113	0.000	45	0	0	15	0	0	
SV-335	P	LAKE JOCASSEE	TPGT	1	49	0	0		D	114	0.000	46	0	0	15	0	0	
SV-334	P	LAKE JOCASSEE	TPGT	1	50	0	0		D	113	0.000	50	0	0	16	0	0	
03060101030																		
SV-741	BIO	EASTATOE CK	ORW															
SV-676	BIO	ROCKY BOTTOM CK	ORW															
SV-230	P/BIO	EASTATOE CK	TPGT	46	54	3	6	623	*	125	0.000	51	0	0	19	0	0	
SV-341	SS/BIO	LITTLE EASTATOE CK	TPGT	226	23	5	22	1280				20	0	0	7	0	0	
SV-338	P	LAKE KEOWEE	FW	1	53	0	0		D	116	0.000	45	0	0	17	0	0	
03060101040																		
SV-249	P	LAKE HARTWELL	FW	4	55	0	0		D	172	0.000	49	0	0	18	0	0	
SV-205	SS/BIO	SIXMILE CK	FW	122	24	3	13	5833				24	0	0	8	0	0	
SV-683	BIO	WILDCAT CK	FW															
SV-360	SS	LAKE ISSAQUEENA	FW	7	18	0	0					18	0	0	6	1	17	20
SV-106	S	LAKE HARTWELL	FW	2	28	0	0		D	82	-0.087	2	0	0	1	0	0	
SV-288	P	LAKE HARTWELL	FW	3	50	0	0		D	167	-0.126	46	0	0	16	0	0	
SV-180	BIO	SIX & TWENTY CK	FW															
SV-181	S	SIX & TWENTY CK	FW	77	30	4	13	705	*	84	-3.143							
SV-339	P	LAKE HARTWELL	FW	1	50	0	0		D	114	0.000	46	0	0	15	0	0	
03060101050																		
SV-684	BIO	CRANE CK	FW															
SV-743	BIO	FLAT SHOALS RIVER	FW															
SV-742	BIO	OCONEE CK	FW															
SV-203	P*	LITTLE RVR	FW	83	41	1	2	520	*	96	1.501	22	0	0	7	0	0	
SV-312	P	LAKE KEOWEE	FW	2	55	0	0		D	171	-0.074	52	0	0	18	0	0	
SV-343	SS/BIO	LITTLE CANE CK	FW	461	23	14	61	985				21	0	0	7	0	0	
SV-342	SS/BIO	CANE CK	FW	306	24	14	58	1154				21	0	0	7	1	14	20
SV-311	P	LAKE KEOWEE	FW	2	56	0	0		D	172	-0.090	49	0	0	17	0	0	
03060101060																		
SV-206	S/BIO	NORTH FORK	FW	170	29	4	14	1008	I	80	6.886							
SV-282		TWELVE MILE CK	FW															
SV-740	BIO	RICES CK	FW															
SV-739	BIO	TWELVE MILE CK	FW															

TUGALOO RIVER/SENECA RIVER BASINS WATER QUALITY SUMMARY

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	CR N	CR EXC.	CR %	MEAN EXC.	CU N	CU EXC.	CU %	MEAN EXC.	PB N	PB EXC.	PB %	MEAN EXC.	HG N	HG EXC.	HG %
03060101010																		
SV-337	P	LAKE JOCASSEE	TPGT	16	0	0		16	0	0		16	0	0		16	0	0
SV-336	P	LAKE JOCASSEE	TPGT	15	0	0		15	0	0		15	0	0		15	0	0
SV-335	P	LAKE JOCASSEE	TPGT	15	0	0		15	0	0		15	1	7	240	15	0	0
SV-334	P	LAKE JOCASSEE	TPGT	16	0	0		16	0	0		16	0	0		16	0	0
03060101030																		
SV-741	BIO	EASTATOE CK	ORW															
SV-676	BIO	ROCKY BOTTOM CK	ORW															
SV-230	P/BIO	EASTATOE CK	TPGT	19	0	0		19	0	0		19	0	0		19	0	0
SV-341	SS/BIO	LITTLE EASTATOE CK	TPGT	7	0	0		7	0	0		7	0	0		7	0	0
SV-338	P	LAKE KEOWEE	FW	17	0	0		17	0	0		17	0	0		16	0	0
03060101040																		
SV-249	P	LAKE HARTWELL	FW	18	0	0		18	0	0		18	0	0		17	0	0
SV-205	SS/BIO	SIXMILE CK	FW	8	0	0		8	0	0		8	0	0		8	0	0
SV-683	BIO	WILDCAT CK	FW															
SV-360	SS	LAKE ISSAQUEENA	FW	6	0	0		6	1	17	20	6	0	0		6	0	0
SV-106	S	LAKE HARTWELL	FW	1	0	0		1	0	0		1	0	0		1	0	0
SV-288	P	LAKE HARTWELL	FW	16	0	0		16	0	0		16	0	0		16	0	0
SV-180	BIO	SIX & TWENTY CK	FW															
SV-181	S	SIX & TWENTY CK	FW															
SV-339	P	LAKE HARTWELL	FW	15	0	0		15	0	0		15	0	0		15	0	0
03060101050																		
SV-684	BIO	CRANE CK	FW															
SV-743	BIO	FLAT SHOALS RIVER	FW															
SV-742	BIO	OCONEE CK	FW															
SV-203	P*	LITTLE RVR	FW	7	0	0		7	0	0		7	0	0		7	0	0
SV-312	P	LAKE KEOWEE	FW	18	0	0		18	0	0		18	0	0		17	0	0
SV-343	SS/BIO	LITTLE CANE CK	FW	7	0	0		7	0	0		7	0	0		7	0	0
SV-342	SS/BIO	CANE CK	FW	7	0	0		7	0	0		7	0	0		7	0	0
SV-311	P	LAKE KEOWEE	FW	17	0	0		17	1	6	100	17	0	0		16	0	0
03060101060																		
SV-206	S/BIO	NORTH FORK	FW															
SV-282		TWELVE MILE CK	FW															
SV-740	BIO	RICES CK	FW															
SV-739	BIO	TWELVE MILE CK	FW															

TUGALOO RIVER/SENECA RIVER BASINS WATER QUALITY SUMMARY

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	NI N	NI EXC.	NI %	MEAN EXC.	ZN N	ZN EXC.	ZN %	MEAN EXC.
03060101010											
SV-337	P	LAKE JOCASSEE	TPGT	16	0	0		16	0	0	
SV-336	P	LAKE JOCASSEE	TPGT	15	0	0		15	0	0	
SV-335	P	LAKE JOCASSEE	TPGT	15	0	0		15	1	7	150
SV-334	P	LAKE JOCASSEE	TPGT	16	0	0		16	0	0	
03060101030											
SV-741	BIO	EASTATOE CK	ORW								
SV-676	BIO	ROCKY BOTTOM CK	ORW								
SV-230	P/BIO	EASTATOE CK	TPGT	19	0	0		19	1	5	90
SV-341	SS/BIO	LITTLE EASTATOE CK	TPGT	7	0	0		7	0	0	
SV-338	P	LAKE KEOWEE	FW	17	0	0		17	0	0	
03060101040											
SV-249	P	LAKE HARTWELL	FW	18	0	0		18	0	0	
SV-205	SS/BIO	SIXMILE CK	FW	8	0	0		8	1	13	100
SV-683	BIO	WILDCAT CK	FW								
SV-360	SS	LAKE ISSAQUEENA	FW	6	0	0		6	1	17	230
SV-106	S	LAKE HARTWELL	FW	1	0	0		1	0	0	
SV-288	P	LAKE HARTWELL	FW	16	0	0		16	0	0	
SV-180	BIO	SIX & TWENTY CK	FW								
SV-181	S	SIX & TWENTY CK	FW								
SV-339	P	LAKE HARTWELL	FW	15	0	0		15	0	0	
03060101050											
SV-684	BIO	CRANE CK	FW								
SV-743	BIO	FLAT SHOALS RIVER	FW								
SV-742	BIO	OCONEE CK	FW								
SV-203	P*	LITTLE RVR	FW	7	0	0		7	0	0	
SV-312	P	LAKE KEOWEE	FW	18	0	0		18	0	0	
SV-343	SS/BIO	LITTLE CANE CK	FW	7	0	0		7	0	0	
SV-342	SS/BIO	CANE CK	FW	7	0	0		7	0	0	
SV-311	P	LAKE KEOWEE	FW	17	1	6	250	17	1	6	830
03060101060											
SV-206	S/BIO	NORTH FORK	FW								
SV-282		TWELVE MILE CK	FW								
SV-740	BIO	RICES CK	FW								
SV-739	BIO	TWELVE MILE CK	FW								

TUGALOO RIVER/SENECA RIVER BASINS WATER QUALITY SUMMARY

STATION				DO	DO	DO	MEAN	TRENDS (86 -2000)					
NUMBER	TYPE	WATERBODY NAME	CLASS	N	EXC.	%	EXC.	DO	N	MAG	BOD	N	MAG
03060101070													
SV-239	S	GOLDEN CK	FW	29	0	0		*	82	0.011	D	80	-0.058
SV-738	BIO	GOLDEN CK	FW										
SV-015	P*	TWELVE MILE CK	FW	24	0	0		*	63	0.015	D	62	-0.075
SV-137	P*	TWELVE MILE CK	FW	24	0	0		I	63	0.045	D	63	-0.085
SV-136	S	UNNAMED	FW	30	0	0		*	83	0.014	D	81	-0.067
SV-107	P*	TWELVE MILE CK	FW	33	0	0		D	72	-0.033	D	62	-0.144
03060101080													
SV-333	P	CONEROSS CK	FW	73	0	0		I	138	0.050	*	135	-0.020
SV-004	P	CONEROSS CK	FW	56	0	0		*	139	-0.025	D	136	-0.066
SV-236	P	LAKE HARTWELL	FW	61	0	0		D	116	-0.033	D	105	-0.081
03060101090													
SV-017	S	EIGHTEENMILE CK	FW	29	0	0		I	87	0.042	D	82	-0.078
SV-241	S	WOODSIDE BRANCH	FW	30	1	3	3.80	I	84	0.060	D	83	-0.276
SV-245	S	EIGHTEENMILE CK	FW	29	0	0		I	87	0.052	D	83	-0.071
SV-135	P/BIO	EIGHTEENMILE CK	FW	57	0	0		I	140	0.028	D	136	-0.050
SV-268	P	EIGHTEENMILE CK	FW	60	0	0		I	125	0.100	I	117	0.100
03060101100													
SV-735	BIO	THREE AND TWENTY CK	FW										
SV-111	P*	THREE & TWENTY CK	FW	42	0	0		I	98	0.025	D	98	-0.051
03060102010													
SV-308	S/BIO	E FORK CHATTOOGA RVR	ORW	29	0	0		*	82	0.000	D	82	-0.037
SV-792	BIO	E FORK CHATTOOGA RVR	ORW										
SV-227	P/BIO	CHATTOOGA RVR	ORW	58	0	0		*	174	0.000	D	173	-0.039
SV-199	P	CHATTOOGA RVR	ORW	58	0	0		*	123	0.000	*	122	-0.013
SV-359	SS	LAKE, TUGALOO	FW	20	1	5	4.17						
03060102060													
SV-358	SS	LAKE YONAH	FW	20	0	0							
SV-673	BIO	BRASSTOWN CK	FW										
SV-200	P*	LAKE HARTWELL	FW	40	0	0		*	95	0.000	D	95	-0.043
03060102120													
SV-675	BIO	CHAUGA RVR	ORW										
SV-344	SS	CHAUGA RVR	FW	24	0	0							
SV-225	BIO	TOXAWAY CK	FW										
03060102130													
SV-301	S	NORRIS CK	FW	29	0	0		I	82	0.043	*	82	-0.020
SV-108	SS/BIO	CHOESTOEA CK	FW	23	0	0							
SV-345	SS/BIO	BEAVERDAM CK	FW	24	0	0							

TUGALOO RIVER/SENECA RIVER BASINS WATER QUALITY SUMMARY

STATION				pH	pH	pH	MEAN	TRENDS (86-2000)			TURB	TURB	TURB	MEAN	TRENDS (86-2000)		
NUMBER	TYPE	WATERBODY NAME	CLASS	N	EXC.	%	EXC.	PH	N	MAG	N	EXC.	%	EXC.	TURB	N	MAG
03060101070																	
SV-239	S	GOLDEN CK	FW	29	0	0		*	82	0.000	27	1	4	55	I	79	0.548
SV-738	BIO	GOLDEN CK	FW														
SV-015	P*	TWELVE MILE CK	FW	24	0	0		*	61	0.000	24	3	13	186.7	*	62	-0.411
SV-137	P*	TWELVE MILE CK	FW	24	0	0		*	62	0.000	24	4	17	63.3	D	61	-1.716
SV-136	S	UNNAMED	FW	30	0	0		*	82	0.000	27	0	0		D	79	-0.152
SV-107	P*	TWELVE MILE CK	FW	32	1	3	8.67	*	69	0.004	23	0	0		*	61	-0.150
03060101080																	
SV-333	P	CONEROSS CK	FW	73	4	5	5.763	*	138	0.000	70	6	9	105.8	D	135	-0.510
SV-004	P	CONEROSS CK	FW	56	4	7	5.850	*	139	0.000	55	6	11	148.3	D	132	-0.375
SV-236	P	LAKE HARTWELL	FW	61	7	11	8.811	*	115	0.003	49	0	0		D	102	-0.060
03060101090																	
SV-017	S	EIGHTEENMILE CK	FW	29	0	0		*	87	0.005	27	2	7	62.5	*	80	0.125
SV-241	S	WOODSIDE BRANCH	FW	30	0	0		D	84	-0.017	28	4	14	75.0	D	81	-0.328
SV-245	S	EIGHTEENMILE CK	FW	29	0	0		*	86	0.006	28	0	0		D	80	-0.300
SV-135	P/BIO	EIGHTEENMILE CK	FW	57	3	5	5.700	*	139	0.000	56	5	9	210.0	*	133	-0.452
SV-268	P	EIGHTEENMILE CK	FW	60	7	12	7.394	I	124	0.045	52	2	4	75.0	D	117	-1.270
03060101100																	
SV-735	BIO	THREE AND TWENTY CK	FW														
SV-111	P*	THREE & TWENTY CK	FW	42	0	0		*	98	0.006	41	2	5	70.0	*	96	-0.252
03060102010																	
SV-308	S/BIO	E FORK CHATTOOGA RVR	ORW	29	0	0		I	81	0.028	28	0	0		*	80	0.000
SV-792	BIO	E FORK CHATTOOGA RVR	ORW														
SV-227	P/BIO	CHATTOOGA RVR	ORW	58	5	9	6.372	*	173	0.000	57	1	2	76	D	171	-0.050
SV-199	P	CHATTOOGA RVR	ORW	58	4	7	6.485	*	123	0.016	57	1	2	60	D	122	-0.131
SV-359	SS	LAKE, TUGALOO	FW	20	0	0					20	0	0				
03060102060																	
SV-358	SS	LAKE YONAH	FW	20	0	0					20	0	0				
SV-673	BIO	BRASSTOWN CK	FW														
SV-200	P*	LAKE HARTWELL	FW	40	2	5	5.850	I	95	0.021	39	1	3	64	*	92	-0.067
03060102120																	
SV-675	BIO	CHAUGA RVR	ORW														
SV-344	SS	CHAUGA RVR	FW	24	0	0					24	1	4	58			
SV-225	BIO	TOXAWAY CK	FW														
03060102130																	
SV-301	S	NORRIS CK	FW	29	0	0		*	82	-0.001	27	0	0		D	78	-0.200
SV-108	SS/BIO	CHOESTOEA CK	FW	23	2	9	5.890				24	2	8	300.0			
SV-345	SS/BIO	BEAVERDAM CK	FW	24	1	4	5.78				25	2	8	123.0			

TUGALOO RIVER/SENECA RIVER BASINS WATER QUALITY SUMMARY

STATION				TP	TP	TP	MEAN	TRENDS (92-2000)			TRENDS (86-2000)		
NUMBER	TYPE	WATERBODY NAME	CLASS	N	EXC.	%	EXC.	TP	N	MAG	TP	N	MAG
03060101070													
SV-239	S	GOLDEN CK	FW								I	65	0.008
SV-738	BIO	GOLDEN CK	FW										
SV-015	P*	TWELVE MILE CK	FW								D	48	-0.005
SV-137	P*	TWELVE MILE CK	FW								D	49	-0.004
SV-136	S	UNNAMED	FW					I	30	0.010	D	64	-0.010
SV-107	P*	TWELVE MILE CK	FW	8	0	0					D	47	0.000
03060101080													
SV-333	P	CONEROSS CK	FW					I	84	0.000	*	102	0.000
SV-004	P	CONEROSS CK	FW					I	67	0.007	D	107	-0.010
SV-236	P	LAKE HARTWELL	FW	22	1	5	0.07	*	42	0.000	*	77	0.000
03060101090													
SV-017	S	EIGHTEENMILE CK	FW					*	32	0.000	D	71	0.000
SV-241	S	WOODSIDE BRANCH	FW					*	30	-0.070	D	66	-0.139
SV-245	S	EIGHTEENMILE CK	FW					*	32	0.007	D	72	-0.017
SV-135	P/BIO	EIGHTEENMILE CK	FW					*	69	0.003	*	108	-0.001
SV-268	P	EIGHTEENMILE CK	FW	24	16	67	0.101				D	88	-0.005
03060101100													
SV-735	BIO	THREE AND TWENTY CK	FW										
SV-111	P*	THREE & TWENTY CK	FW					*	37	-0.003	D	72	-0.002
03060102010													
SV-308	S/BIO	E FORK CHATTOOGA RVR	ORW								*	64	0.000
SV-792	BIO	E FORK CHATTOOGA RVR	ORW										
SV-227	P/BIO	CHATTOOGA RVR	ORW					*	73	0.000	*	140	0.000
SV-199	P	CHATTOOGA RVR	ORW					I	72	0.000	I	89	0.000
SV-359	SS	LAKE, TUGALOO	FW	6	1	17	0.04						
03060102060													
SV-358	SS	LAKE YONAH	FW	6	2	33	0.040						
SV-673	BIO	BRASSTOWN CK	FW										
SV-200	P*	LAKE HARTWELL	FW	18	0	0		*	37	0.000	*	73	0.000
03060102120													
SV-675	BIO	CHAUGA RVR	ORW										
SV-344	SS	CHAUGA RVR	FW										
SV-225	BIO	TOXAWAY CK	FW										
03060102130													
SV-301	S	NORRIS CK	FW					*	30	0.000	D	66	0.000
SV-108	SS/BIO	CHOESTOEA CK	FW										
SV-345	SS/BIO	BEAVERDAM CK	FW										

TUGALOO RIVER/SENECA RIVER BASINS WATER QUALITY SUMMARY

STATION				TN	TN	TN	MEAN	TRENDS (86-2000)			CHL	CHL	CHL	MEAN	TRENDS (86-2000)		
NUMBER	TYPE	WATERBODY NAME	CLASS	N	EXC.	%	EXC.	TN	N	MAG	N	EXC.	%	EXC.	TSS	N	MAG
03060101070																	
SV-239	S	GOLDEN CK	FW														
SV-738	BIO	GOLDEN CK	FW														
SV-015	P*	TWELVE MILE CK	FW														
SV-137	P*	TWELVE MILE CK	FW														
SV-136	S	UNNAMED	FW														
SV-107	P*	TWELVE MILE CK	FW	22	0	0					23	0	0				
03060101080																	
SV-333	P	CONEROSS CK	FW					*	136	0.000					*	15	1.003
SV-004	P	CONEROSS CK	FW					I	96	0.035							
SV-236	P	LAKE HARTWELL	FW	48	0	0		*	51	0.010	23	0	0				
03060101090																	
SV-017	S	EIGHTEENMILE CK	FW														
SV-241	S	WOODSIDE BRANCH	FW														
SV-245	S	EIGHTEENMILE CK	FW														
SV-135	P/BIO	EIGHTEENMILE CK	FW					*	101	0.000							
SV-268	P	EIGHTEENMILE CK	FW	50	0	0		*	114	0.005	21	8	38	54.64			
03060101100																	
SV-735	BIO	THREE AND TWENTY CK	FW														
SV-111	P*	THREE & TWENTY CK	FW														
03060102010																	
SV-308	S/BIO	E FORK CHATTOOGA RVR	ORW														
SV-792	BIO	E FORK CHATTOOGA RVR	ORW														
SV-227	P/BIO	CHATTOOGA RVR	ORW					D	169	-0.006							
SV-199	P	CHATTOOGA RVR	ORW					*	117	0.000							
SV-359	SS	LAKE, TUGALOO	FW	19	0	0					12	0	0				
03060102060																	
SV-358	SS	LAKE YONAH	FW	20	0	0					12	0	0				
SV-673	BIO	BRASSTOWN CK	FW														
SV-200	P*	LAKE HARTWELL	FW	23	0	0											
03060102120																	
SV-675	BIO	CHAUGA RVR	ORW														
SV-344	SS	CHAUGA RVR	FW														
SV-225	BIO	TOXAWAY CK	FW														
03060102130																	
SV-301	S	NORRIS CK	FW														
SV-108	SS/BIO	CHOESTOEA CK	FW														
SV-345	SS/BIO	BEAVERDAM CK	FW														

TUGALOO RIVER/SENECA RIVER BASINS WATER QUALITY SUMMARY

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	GEO MEAN	BACT N	BACT EXC.	BACT %	MEAN EXC.	TRENDS (86-2000) BACT	N	MAG	NH3 N	NH3 EXC.	NH3 %	CD N	CD EXC.	CD %	MEAN EXC.
03060101070																		
SV-239	S	GOLDEN CK	FW	483	28	18	64	811	*	80	6.050							
SV-738	BIO	GOLDEN CK	FW															
SV-015	P*	TWELVE MILE CK	FW	399	24	9	38	1642	I	61	14.243	24	0	0	8	0	0	
SV-137	P*	TWELVE MILE CK	FW	168	24	6	25	1025	*	62	5.112	23	0	0	8	0	0	
SV-136	S	UNNAMED	FW	233	28	6	21	1017	I	80	15.017							
SV-107	P*	TWELVE MILE CK	FW	6	23	0	0		D	61	-0.496	22	0	0	7	0	0	
03060101080																		
SV-333	P	CONEROSS CK	FW	248	70	14	20	1661	*	134	-3.986	63	0	0	20	0	0	
SV-004	P	CONEROSS CK	FW	208	56	11	20	1740	I	134	5.856	50	0	0	16	0	0	
SV-236	P	LAKE HARTWELL	FW	2	50	0	0		D	105	-0.111	47	0	0	15	0	0	
03060101090																		
SV-017	S	EIGHTEENMILE CK	FW	532	28	17	61	1423	*	80	3.633							
SV-241	S	WOODSIDE BRANCH	FW	265	28	6	21	1377	D	80	-64.742							
SV-245	S	EIGHTEENMILE CK	FW	315	28	9	32	1064	*	80	-5.045							
SV-135	P/BIO	EIGHTEENMILE CK	FW	470	55	32	58	1525	I	133	24.406	54	0	0	18	0	0	
SV-268	P	EIGHTEENMILE CK	FW	61	51	6	12	718	D	116	-6.727	49	0	0	17	0	0	
03060101100																		
SV-735	BIO	THREE AND TWENTY CK	FW															
SV-111	P*	THREE & TWENTY CK	FW	359	41	16	39	724	I	97	12.854	24	0	0	8	0	0	
03060102010																		
SV-308	S/BIO	E FORK CHATTOOGA RVR	ORW	30	29	0	0		*	81	0.667	1	0	0				
SV-792	BIO	E FORK CHATTOOGA RVR	ORW															
SV-227	P/BIO	CHATTOOGA RVR	ORW	9	58	0	0		I	173	0.143	54	0	0	20	0	0	
SV-199	P	CHATTOOGA RVR	ORW	15	58	0	0		D	122	-1.001	52	0	0	20	0	0	
SV-359	SS	LAKE, TUGALOO	FW	4	20	0	0					19	0	0	5	0	0	
03060102060																		
SV-358	SS	LAKE YONAH	FW	3	20	0	0					18	0	0	6	0	0	
SV-673	BIO	BRASSTOWN CK	FW															
SV-200	P*	LAKE HARTWELL	FW	8	40	2	5	795	*	94	0.000	24	0	0	12	0	0	
03060102120																		
SV-675	BIO	CHAUGA RVR	ORW															
SV-344	SS	CHAUGA RVR	FW	42	24	3	13	977				23	0	0	8	0	0	
SV-225	BIO	TOXAWAY CK	FW															
03060102130																		
SV-301	S	NORRIS CK	FW	524	28	17	61	1325	I	80	17.036							
SV-108	SS/BIO	CHOESTOEA CK	FW	581	23	15	65	2243				20	0	0	7	0	0	
SV-345	SS/BIO	BEAVERDAM CK	FW	300	24	9	38	2486				21	0	0	6	0	0	

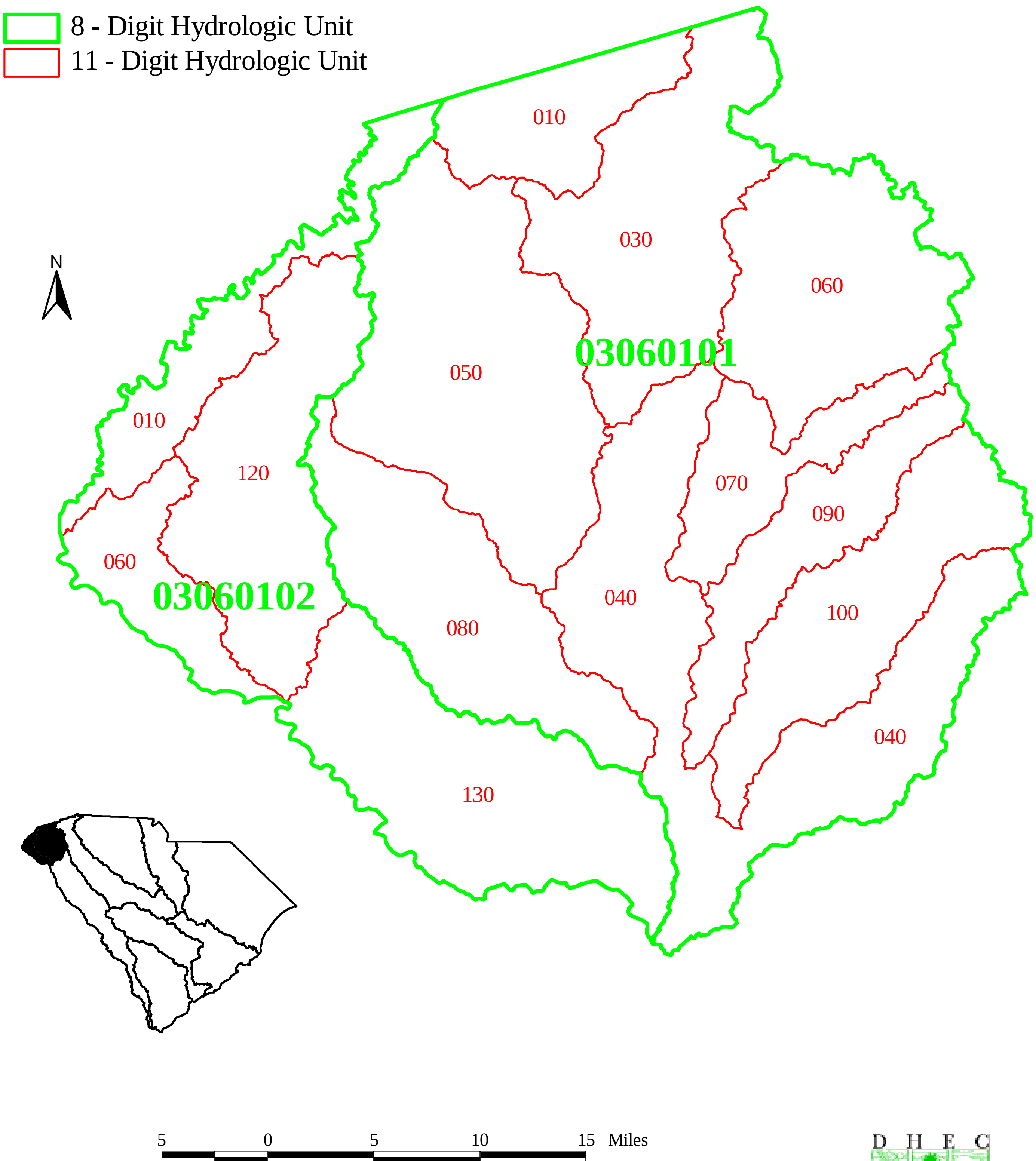
TUGALOO RIVER/SENECA RIVER BASINS WATER QUALITY SUMMARY

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	CR N	CR EXC.	CR %	MEAN EXC.	CU N	CU EXC.	CU %	MEAN EXC.	PB N	PB EXC.	PB %	MEAN EXC.	HG N	HG EXC.	HG %
03060101070																		
SV-239	S	GOLDEN CK	FW															
SV-738	BIO	GOLDEN CK	FW															
SV-015	P*	TWELVE MILE CK	FW	8	0	0		8	0	0		8	0	0		8	0	0
SV-137	P*	TWELVE MILE CK	FW	8	0	0		8	0	0		8	0	0		8	0	0
SV-136	S	UNNAMED	FW															
SV-107	P*	TWELVE MILE CK	FW	7	0	0		7	1	14	20	7	0	0		7	0	0
03060101080																		
SV-333	P	CONEROSS CK	FW	20	0	0		20	2	10	30.0	20	0	0		20	0	0
SV-004	P	CONEROSS CK	FW	16	0	0		16	2	13	30.0	16	0	0		16	0	0
SV-236	P	LAKE HARTWELL	FW	15	0	0		15	1	7	20	15	0	0		15	0	0
03060101090																		
SV-017	S	EIGHTEENMILE CK	FW															
SV-241	S	WOODSIDE BRANCH	FW															
SV-245	S	EIGHTEENMILE CK	FW															
SV-135	P/BIO	EIGHTEENMILE CK	FW	18	0	0		18	0	0		18	0	0		18	0	0
SV-268	P	EIGHTEENMILE CK	FW	17	0	0		17	0	0		17	0	0		17	0	0
03060101100																		
SV-735	BIO	THREE AND TWENTY CK	FW															
SV-111	P*	THREE & TWENTY CK	FW	8	0	0		8	0	0		8	0	0		8	0	0
03060102010																		
SV-308	S/BIO	E FORK CHATTOOGA RVR	ORW															
SV-792	BIO	E FORK CHATTOOGA RVR	ORW															
SV-227	P/BIO	CHATTOOGA RVR	ORW	20	0	0		20	1	5	20	20	0	0		20	0	0
SV-199	P	CHATTOOGA RVR	ORW	20	0	0		20	1	5	20	20	0	0		20	0	0
SV-359	SS	LAKE, TUGALOO	FW	5	0	0		5	0	0		5	0	0		5	0	0
03060102060																		
SV-358	SS	LAKE YONAH	FW	6	0	0		6	0	0		6	0	0		6	0	0
SV-673	BIO	BRASSTOWN CK	FW															
SV-200	P*	LAKE HARTWELL	FW	12	0	0		12	0	0		12	0	0		12	0	0
03060102120																		
SV-675	BIO	CHAUGA RVR	ORW															
SV-344	SS	CHAUGA RVR	FW	8	0	0		8	0	0		8	0	0		8	0	0
SV-225	BIO	TOXAWAY CK	FW															
03060102130																		
SV-301	S	NORRIS CK	FW															
SV-108	SS/BIO	CHOESTOEA CK	FW	7	0	0		7	0	0		7	0	0		7	0	0
SV-345	SS/BIO	BEAVERDAM CK	FW	6	0	0		6	0	0		6	0	0		6	0	0

TUGALOO RIVER/SENECA RIVER BASINS WATER QUALITY SUMMARY

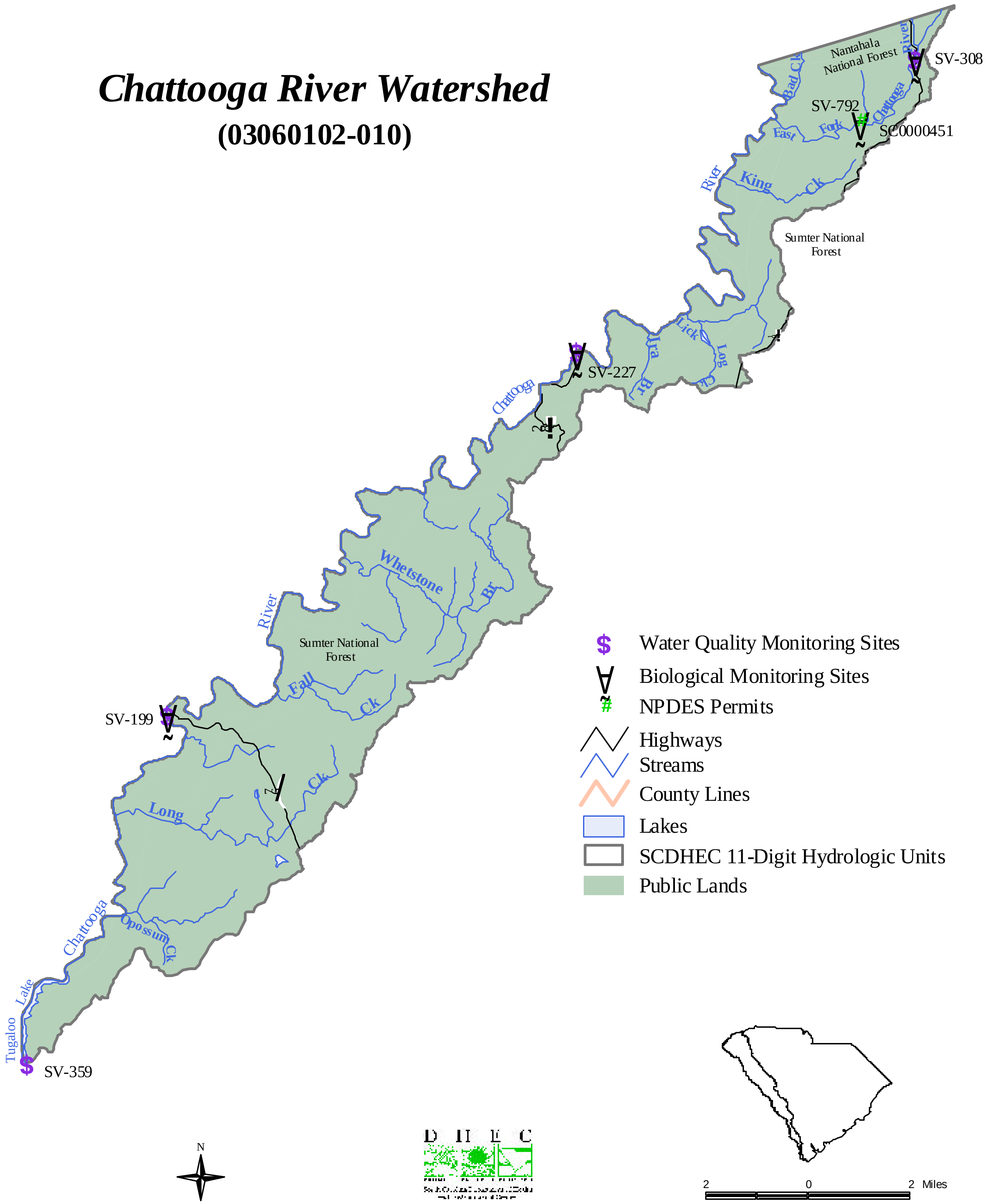
STATION NUMBER	TYPE	WATERBODY NAME	CLASS	NI N	NI EXC.	NI %	MEAN EXC.	ZN N	ZN EXC.	ZN %	MEAN EXC.
03060101070											
SV-239	S	GOLDEN CK	FW								
SV-738	BIO	GOLDEN CK	FW								
SV-015	P*	TWELVE MILE CK	FW	8	0	0		8	0	0	
SV-137	P*	TWELVE MILE CK	FW	8	0	0		8	0	0	
SV-136	S	UNNAMED	FW								
SV-107	P*	TWELVE MILE CK	FW	7	0	0		7	0	0	
03060101080											
SV-333	P	CONEROSS CK	FW	20	0	0		20	1	5	160
SV-004	P	CONEROSS CK	FW	16	0	0		16	0	0	
SV-236	P	LAKE HARTWELL	FW	15	0	0		15	0	0	
03060101090											
SV-017	S	EIGHTEENMILE CK	FW								
SV-241	S	WOODSIDE BRANCH	FW								
SV-245	S	EIGHTEENMILE CK	FW								
SV-135	P/BIO	EIGHTEENMILE CK	FW	18	0	0		18	0	0	
SV-268	P	EIGHTEENMILE CK	FW	17	0	0		17	0	0	
03060101100											
SV-735	BIO	THREE AND TWENTY CK	FW								
SV-111	P*	THREE & TWENTY CK	FW	8	0	0		8	0	0	
03060102010											
SV-308	S/BIO	E FORK CHATTOOGA RVR	ORW								
SV-792	BIO	E FORK CHATTOOGA RVR	ORW								
SV-227	P/BIO	CHATTOOGA RVR	ORW	20	0	0		20	0	0	
SV-199	P	CHATTOOGA RVR	ORW	20	0	0		20	0	0	
SV-359	SS	LAKE, TUGALOO	FW	5	0	0		5	0	0	
03060102060											
SV-358	SS	LAKE YONAH	FW	6	0	0		6	0	0	
SV-673	BIO	BRASSTOWN CK	FW								
SV-200	P*	LAKE HARTWELL	FW	12	0	0		12	0	0	
03060102120											
SV-675	BIO	CHAUGA RVR	ORW								
SV-344	SS	CHAUGA RVR	FW	8	0	0		8	0	0	
SV-225	BIO	TOXAWAY CK	FW								
03060102130											
SV-301	S	NORRIS CK	FW								
SV-108	SS/BIO	CHOESTOEA CK	FW	7	0	0		7	0	0	
SV-345	SS/BIO	BEAVERDAM CK	FW	6	0	0		6	0	0	

Tugaloo/Seneca River Basin
Watershed Unit Index Map



Chattooga River Watershed

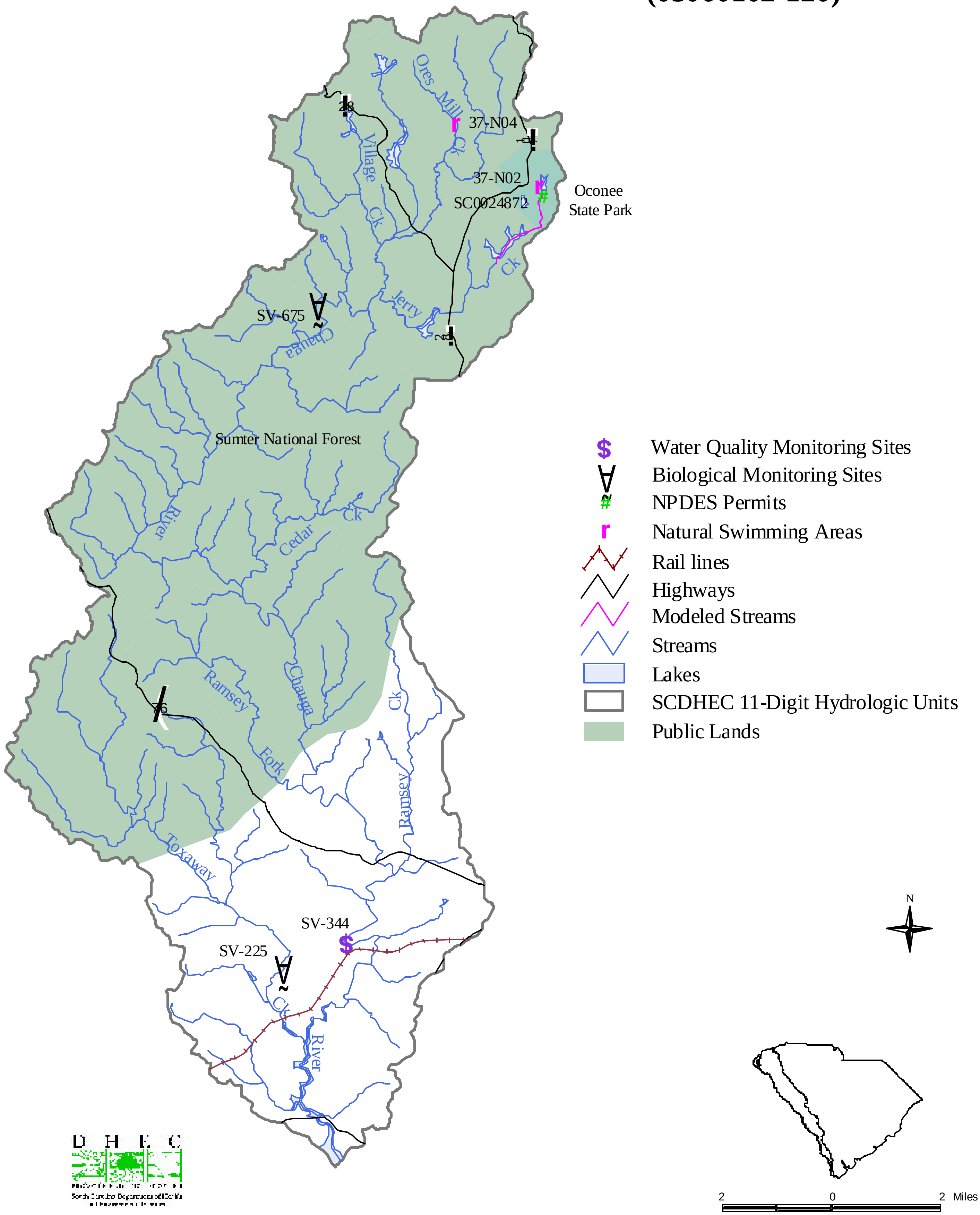
(03060102-010)

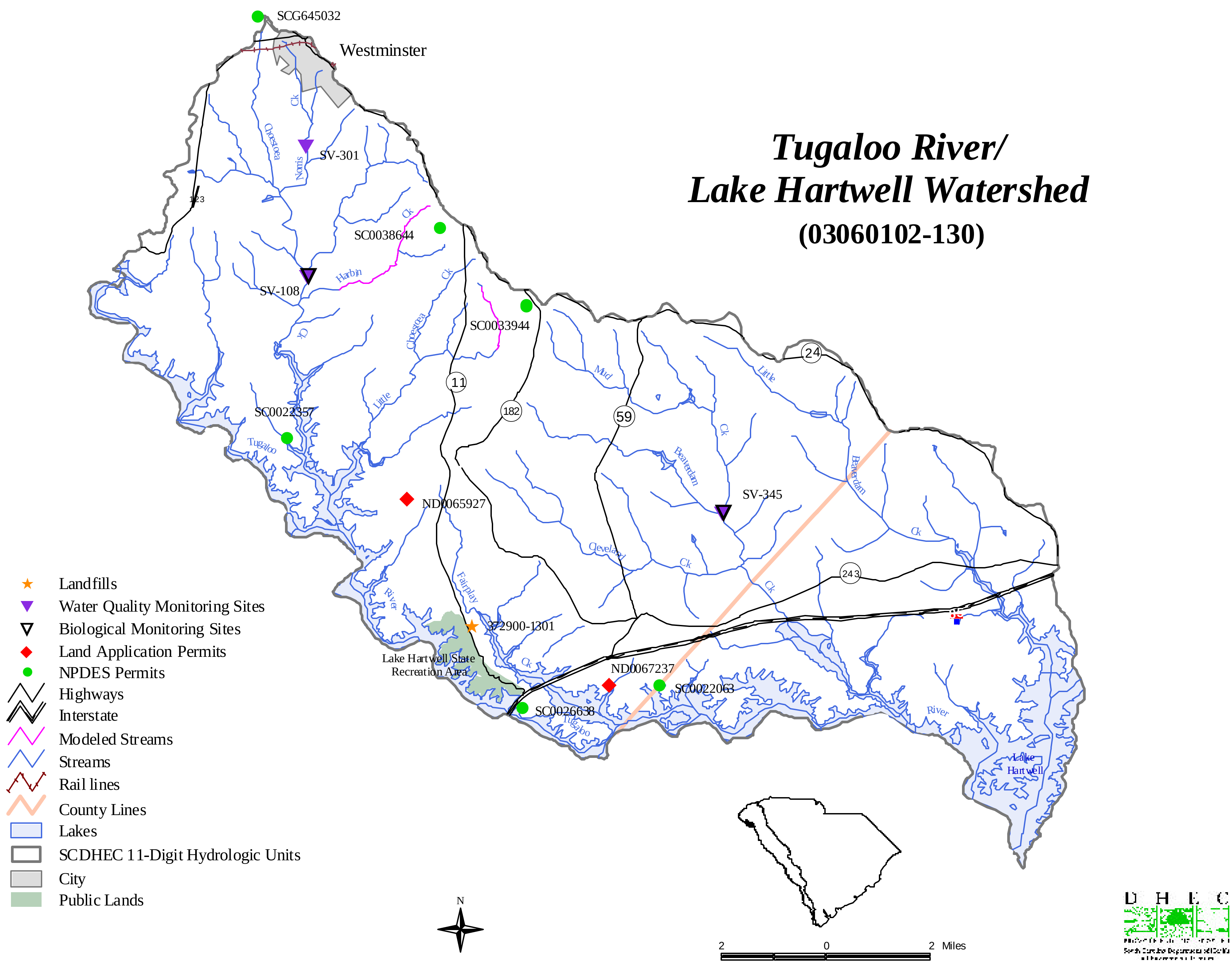



Tugaloo River Watershed
(03060102-060)
Sumter National Forest
SV-673
SV-358
SV-200
Lake Yonah
Lake Hartwell
Battle Ck
Brasstown Ck
Tugaloo River
Barton Ck
Longnose Ck
Gryer Br
Water Quality Monitoring Sites
Biological Monitoring Sites
Highways
Streams
Rail lines
County Lines
Lakes
SCDHEC 11-Digit Hydrologic Units
Public Lands
N
2
0
2
Miles
D H E C

Chauga River Watershed

(03060102-120)

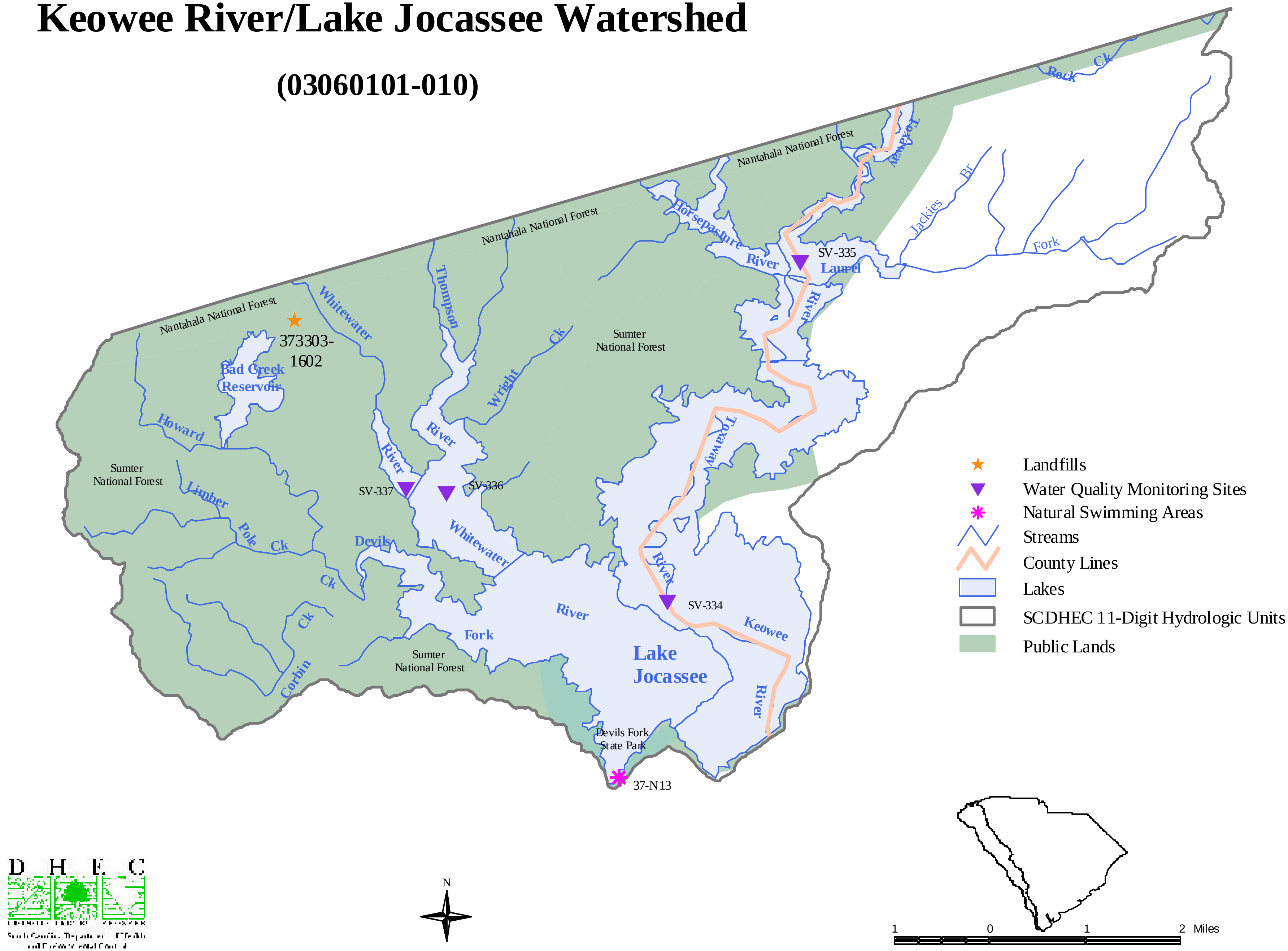




Tugaloo River/
Lake Hartwell Watershed
(03060102-130)
Westminster
SCG645032
SV-301
SC0038644
SV-108
SC0033944
SC0022357
ND0065927
372900-1301
Lake Hartwell State Recreation Area
ND0067237
SC0022063
SC0026638
SV-345
Lake Hartwell
Landfills
Water Quality Monitoring Sites
Biological Monitoring Sites
Land Application Permits
NPDES Permits
Highways
Interstate
Modeled Streams
Streams
Rail lines
County Lines
Lakes
SCDHEC 11-Digit Hydrologic Units
City
Public Lands
N
2 0 2 Miles
DHEC

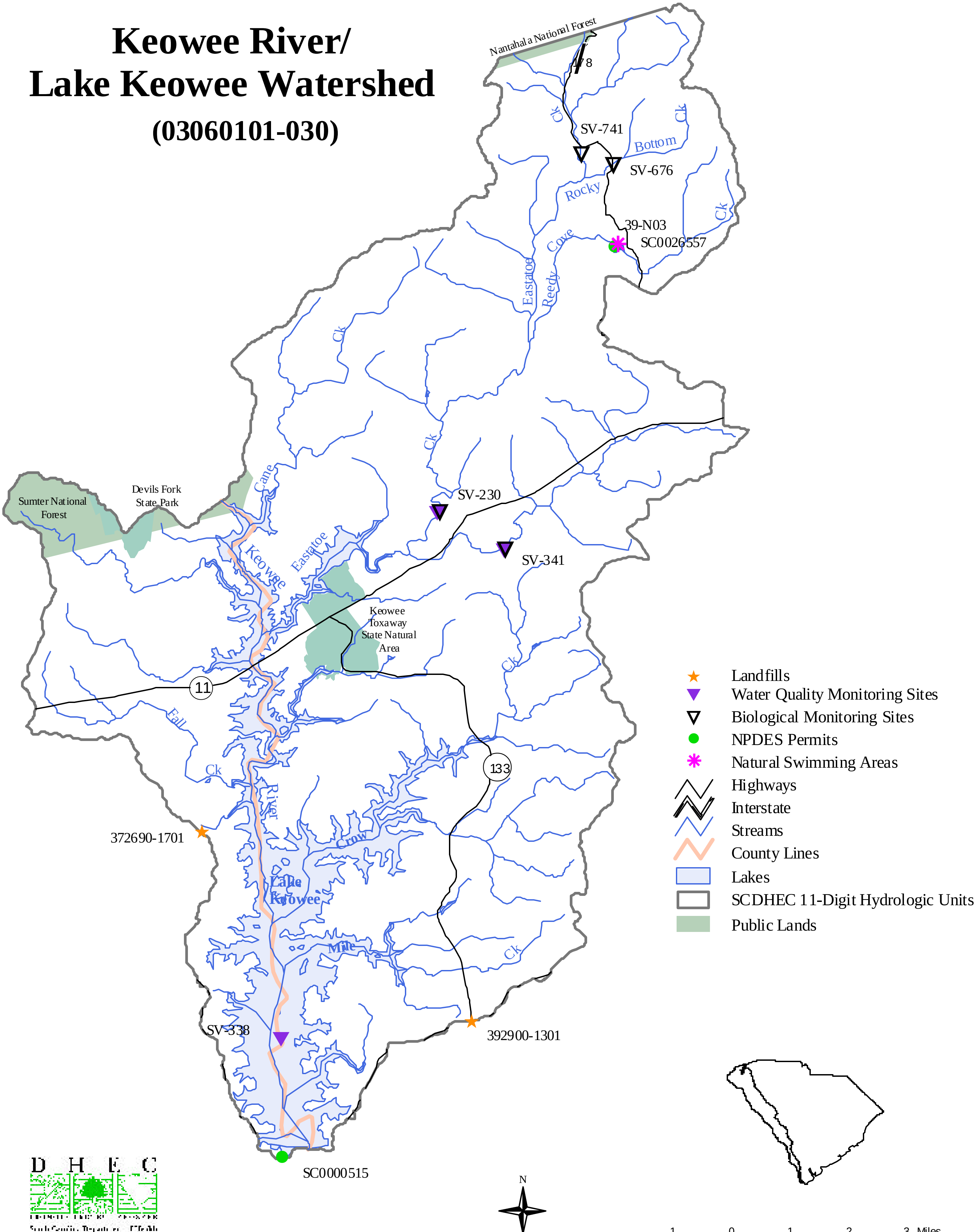
Keowee River/Lake Jocassee Watershed

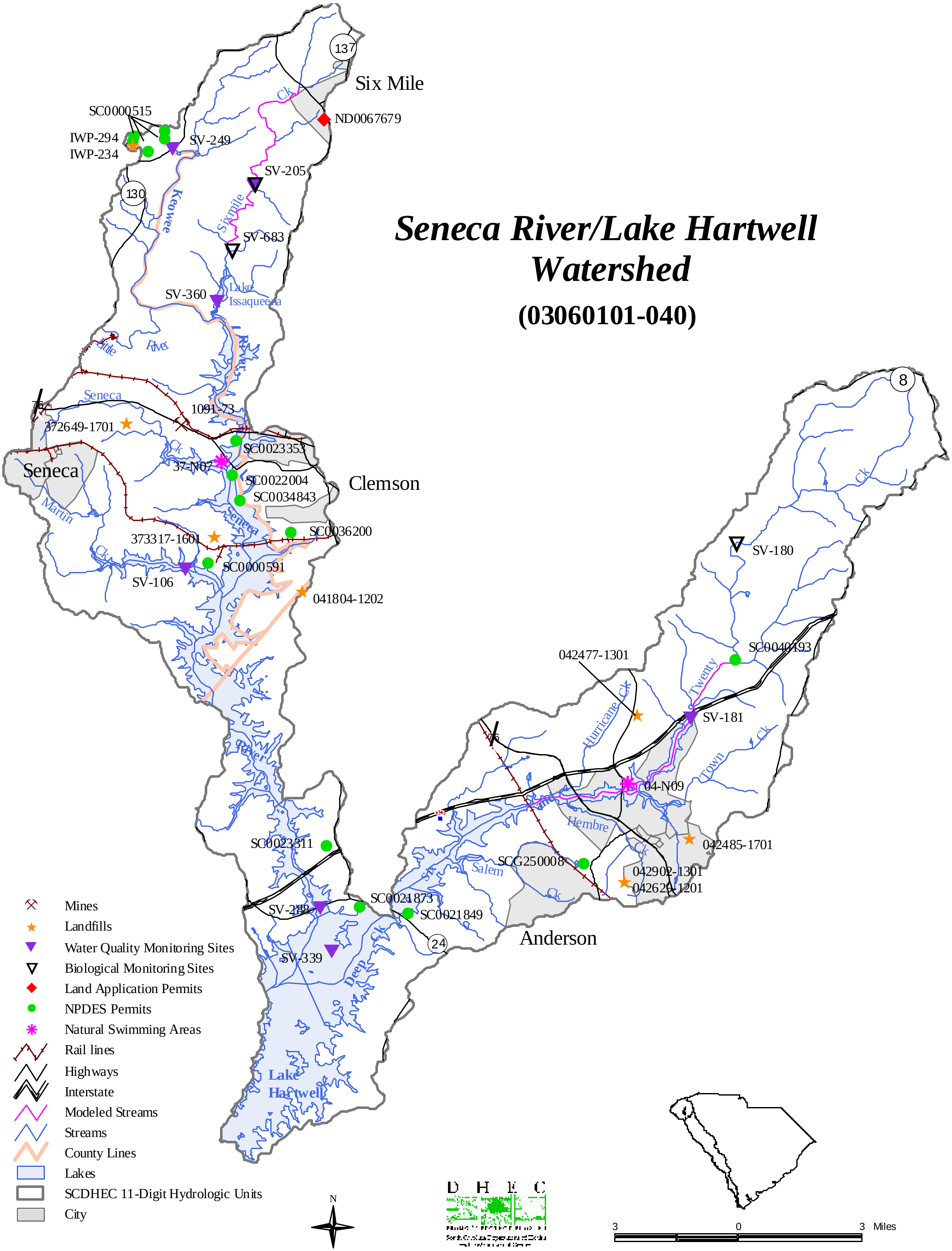
(03060101-010)



Keowee River/ Lake Keowee Watershed

(03060101-030)

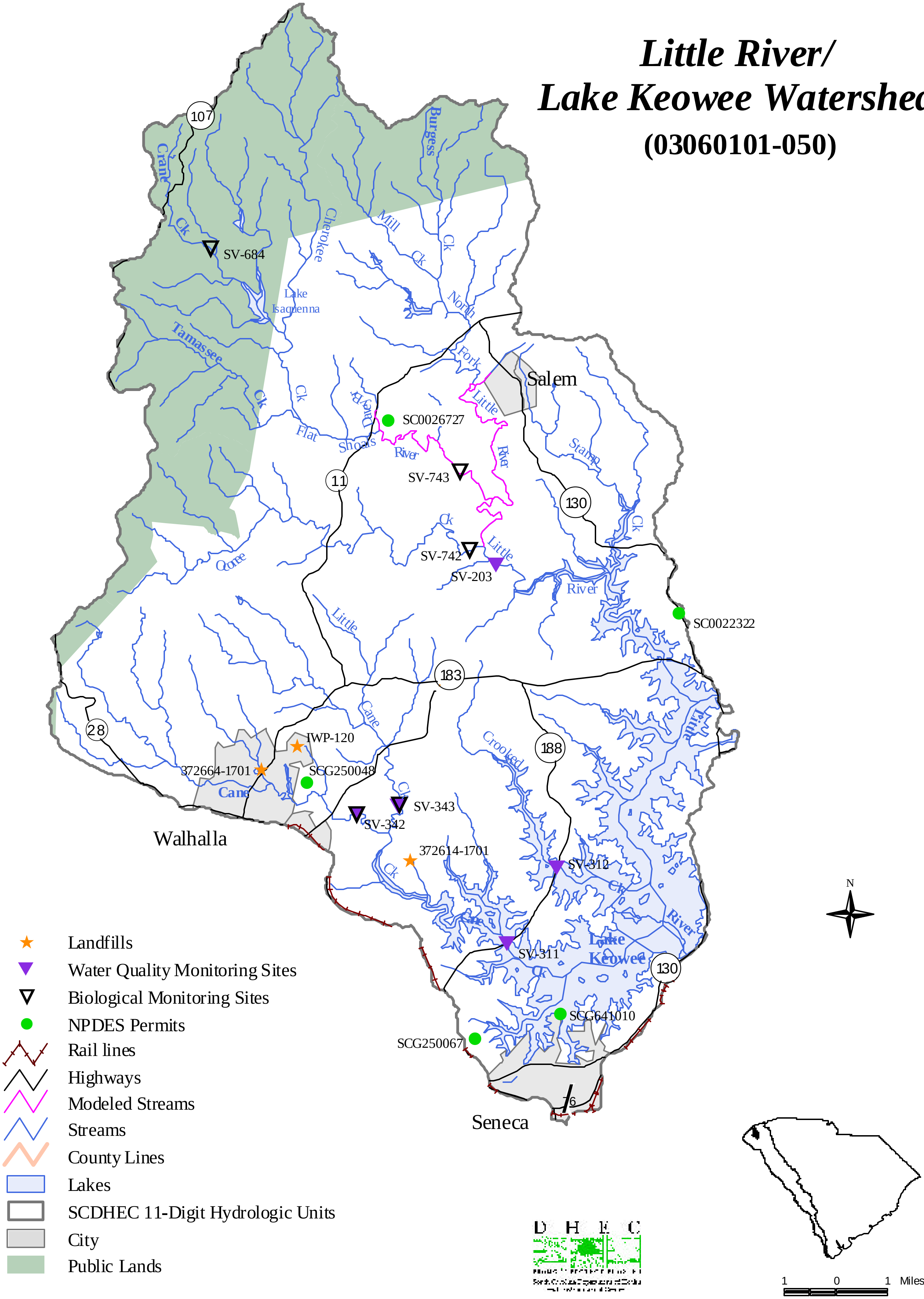




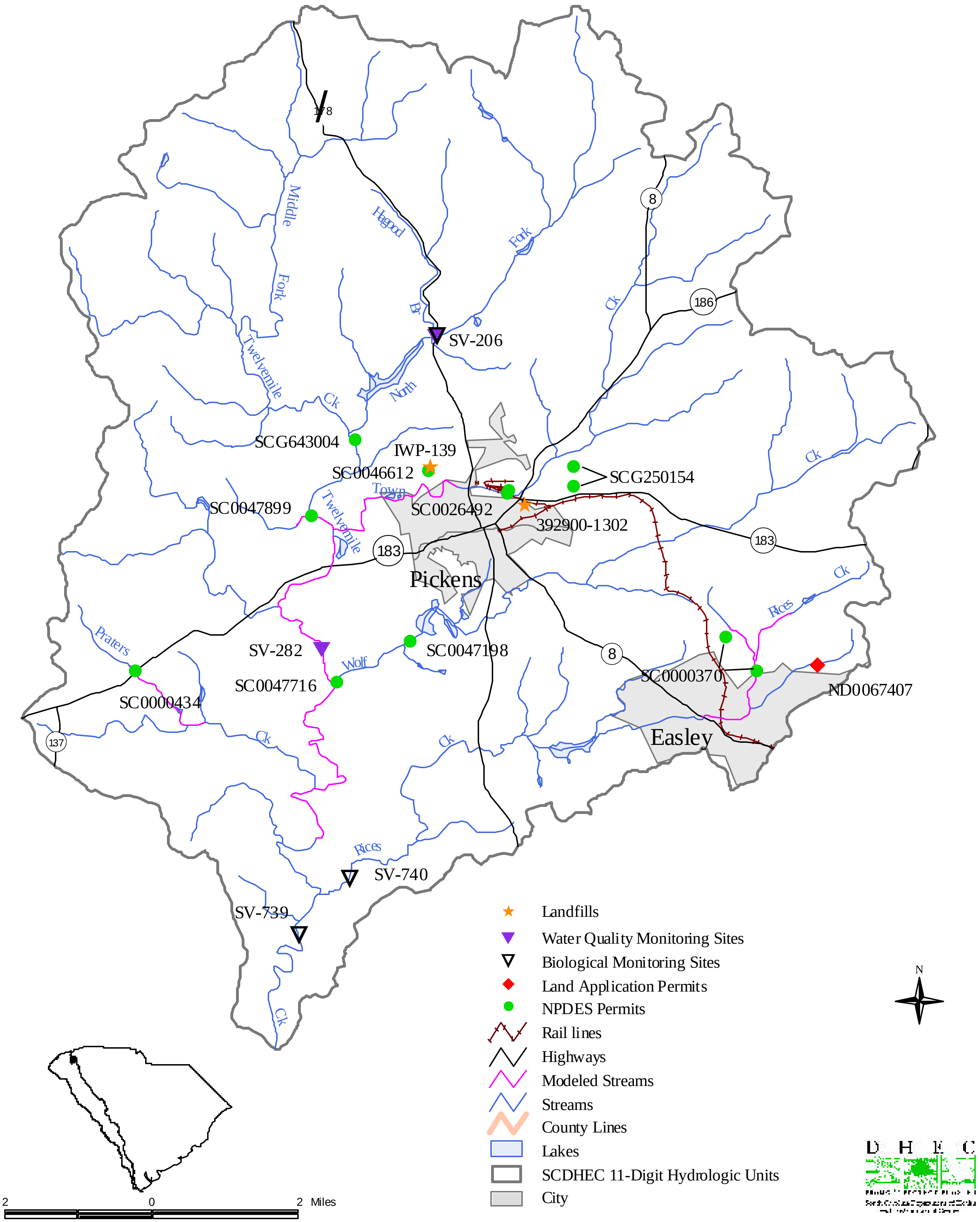
Seneca River/Lake Hartwell Watershed
(03060101-040)
Six Mile
137
ND0067679
SC0000515
IWP-294
IWP-234
SV-249
SV-205
130
Keowee
Sixmile
Ck
SV-683
SV-360
Lake
Issaqueena
Little
River
Seneca
76
1091-73
372649-1701
SC0023353
37-N07
Seneca
Clemson
SC0022004
SC0034843
Martin
Ck
373317-1601
SC0036200
SC0000591
SV-106
041804-1202
8
Ck
SV-180
SC0040193
042477-1301
Twenty
Hurricane
Ck
SV-181
76
Ck
Town
04-N09
Hembre
042485-1701
SCG250008
Salem
Ck
042902-1301
042620-1201
SC0023311
SC0021873
SV-288
SC0021849
24
Anderson
SV-339
Deep
Ck
Lake
Hartwell
Mines
Landfills
Water Quality Monitoring Sites
Biological Monitoring Sites
Land Application Permits
NPDES Permits
Natural Swimming Areas
Rail lines
Highways
Interstate
Modeled Streams
Streams
County Lines
Lakes
SCDHEC 11-Digit Hydrologic Units
City
N
3
0
3
Miles

Little River/ Lake Keowee Watershed

(03060101-050)

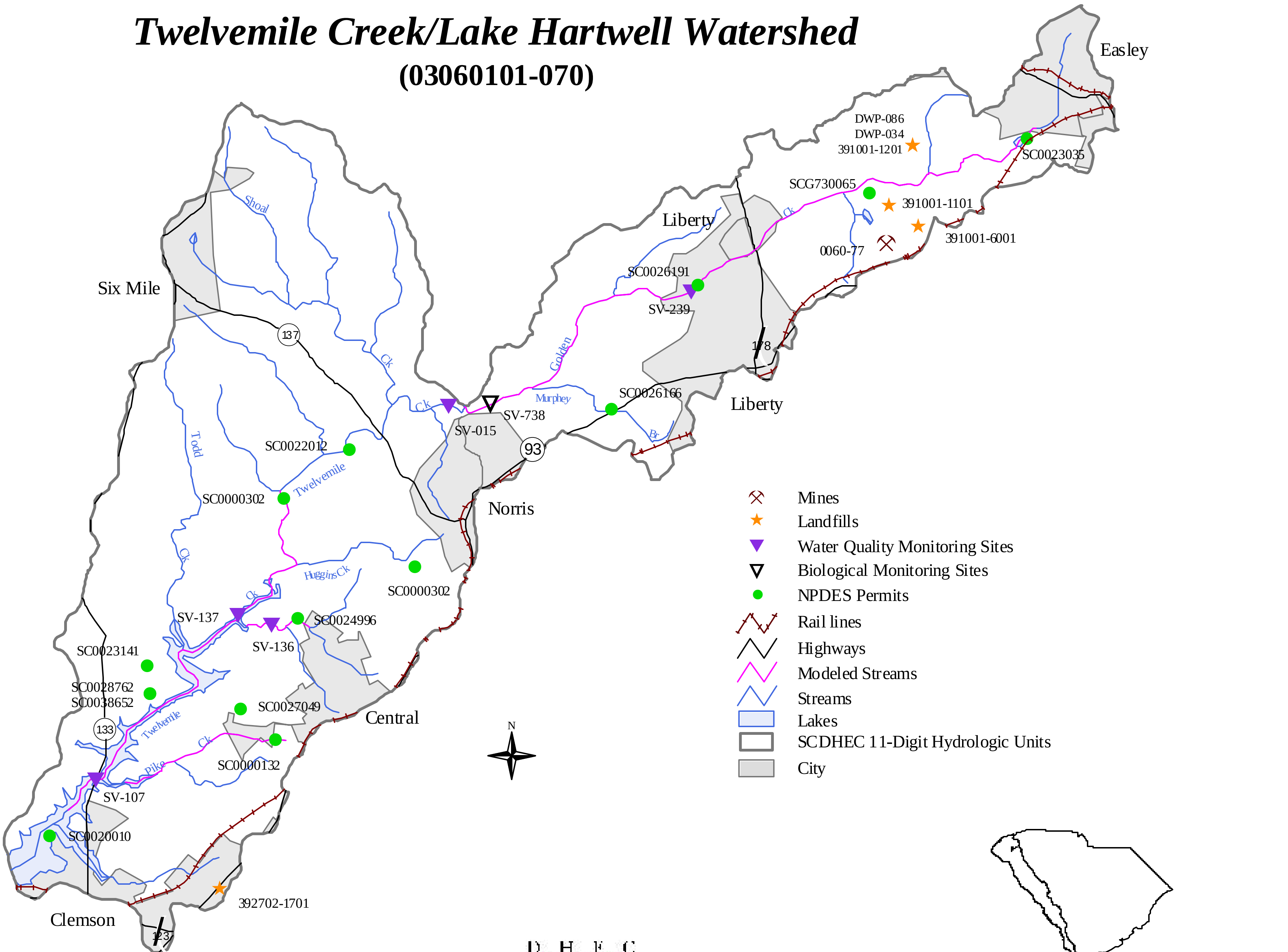


Twelvemile Creek Watershed
(03060101-060)



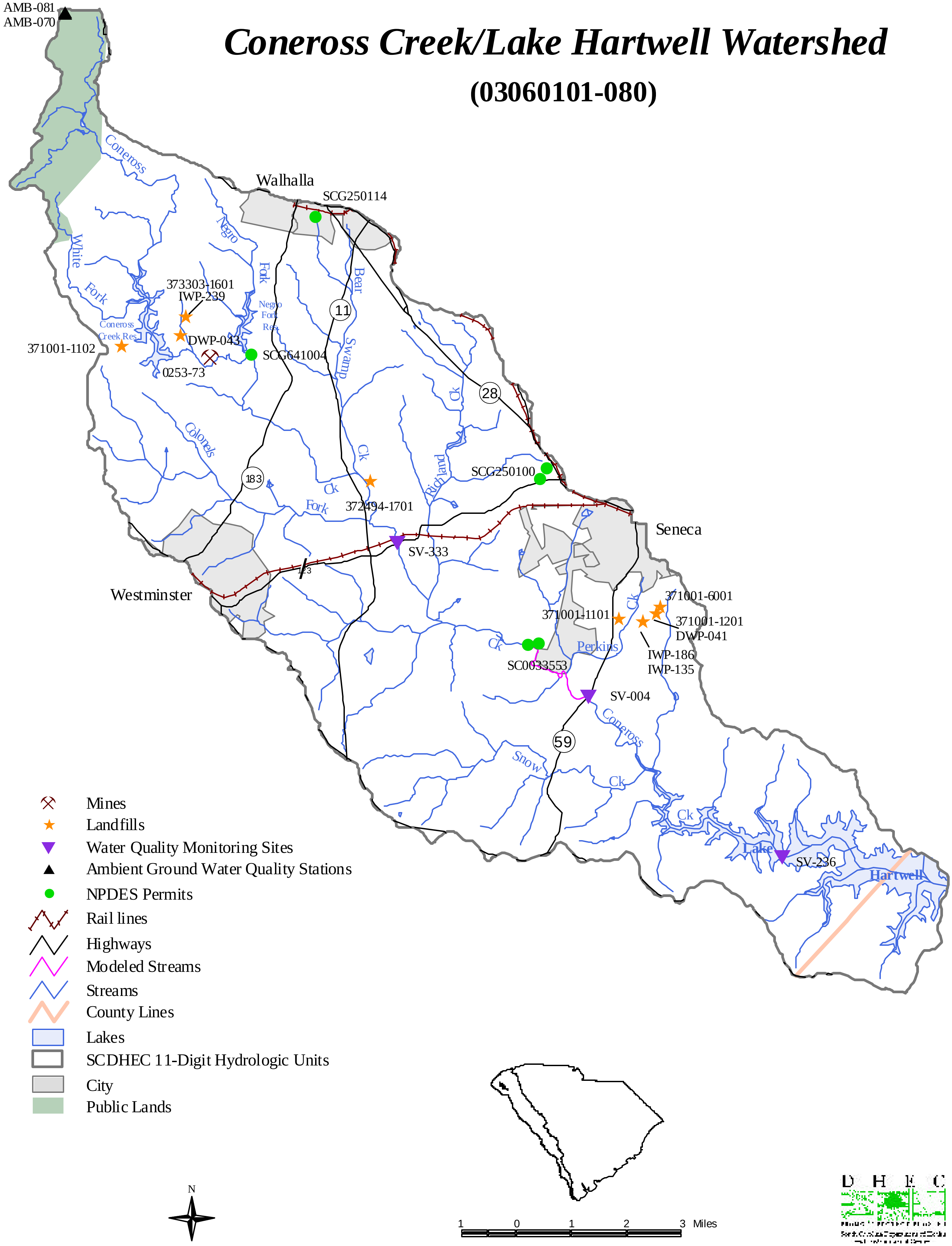
Twelvemile Creek/Lake Hartwell Watershed

(03060101-070)



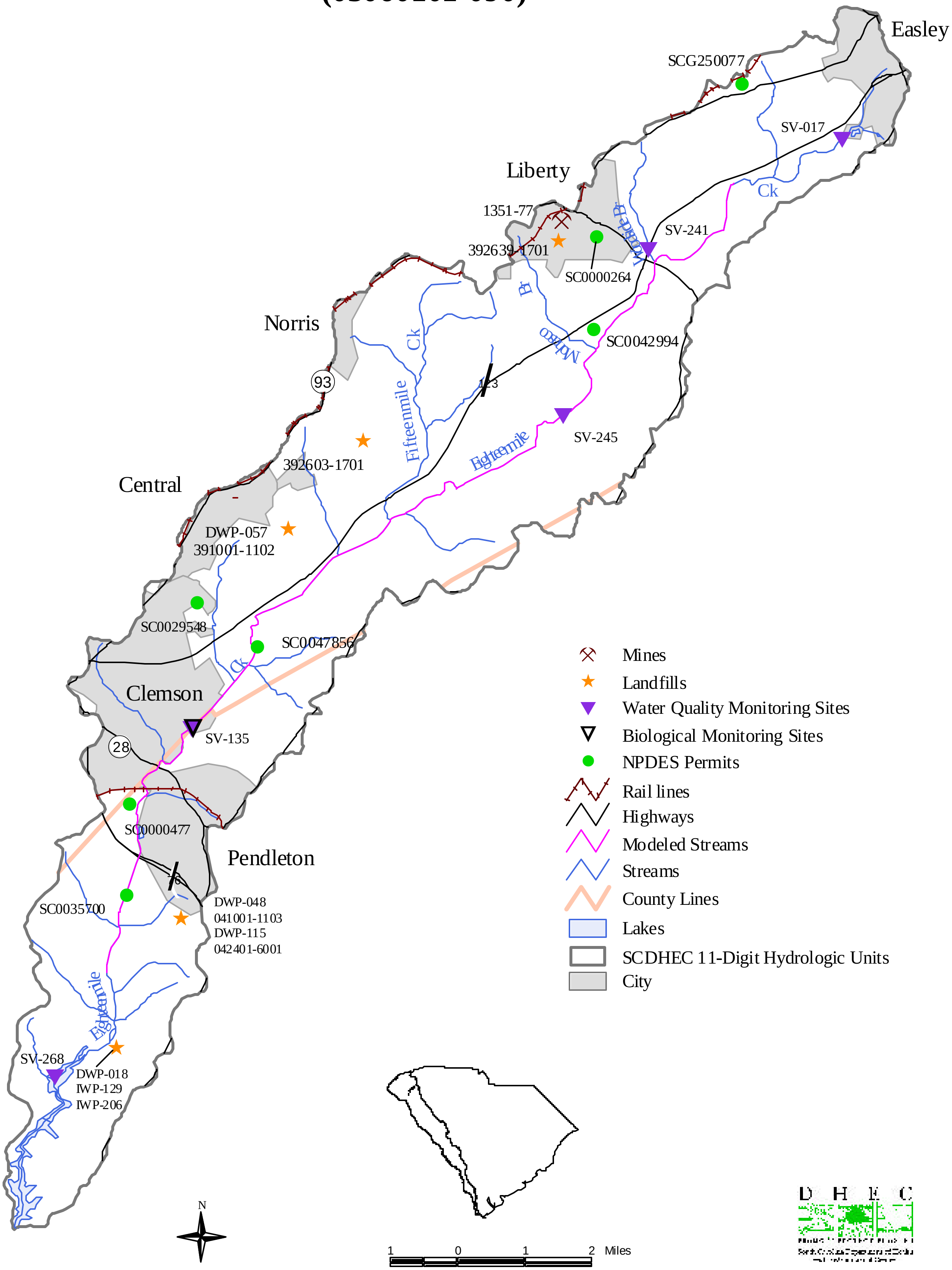
Coneross Creek/Lake Hartwell Watershed

(03060101-080)



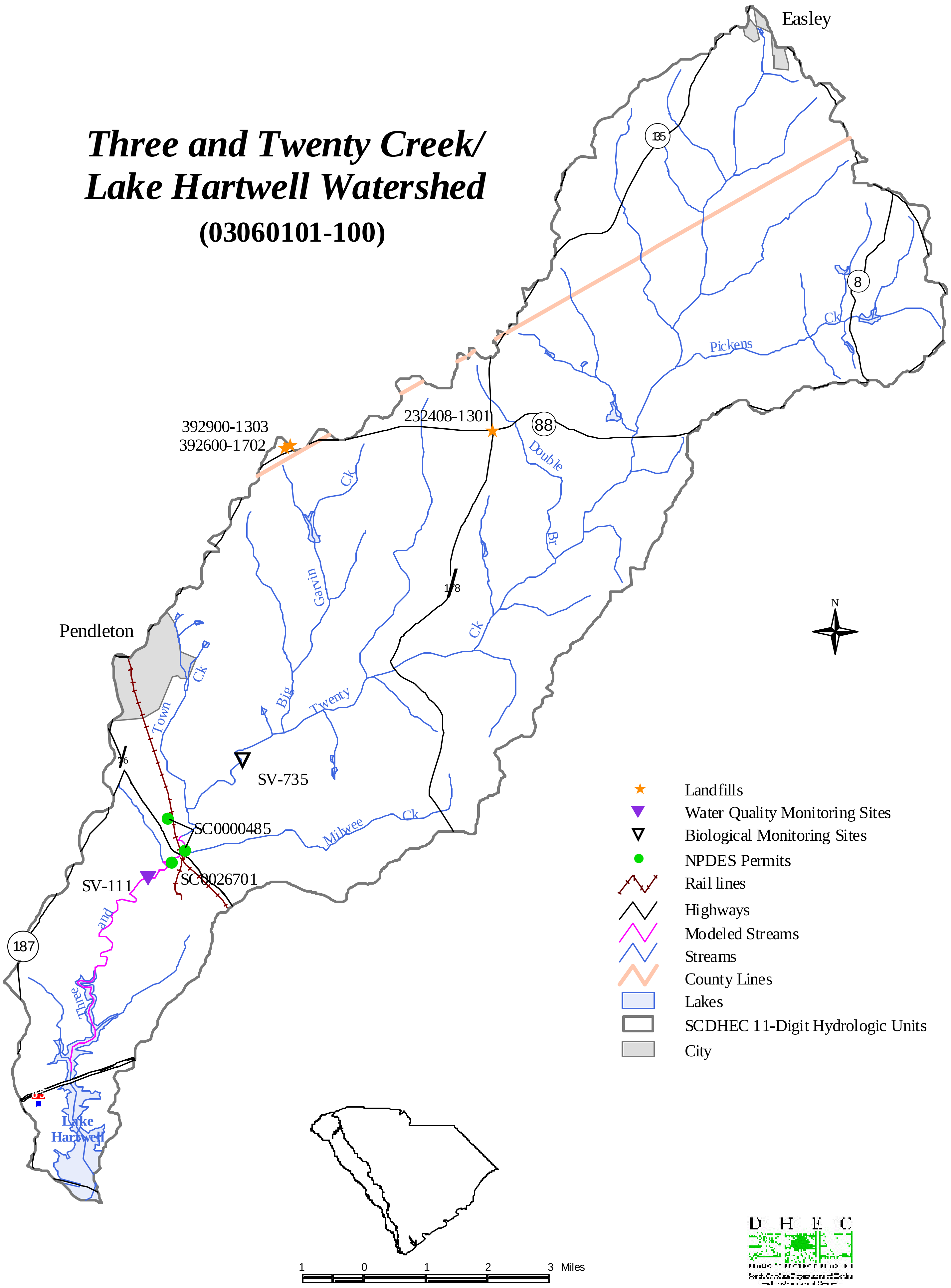
Eighteenmile Creek/Lake Hartwell Watershed

(03060101-090)



Three and Twenty Creek/ Lake Hartwell Watershed

(03060101-100)



APPENDIX C.

Upper Savannah River Basin

Ambient Water Quality Monitoring Site Descriptions

Station #	Type	Class	Description
03060103-020			
SV-340	P	FW	Lake Hartwell, main body at USACE WQ buoy between markers 11 & 12
03060103-030			
SV-100	P	FW	Lake Russell at SC 181, 6.5 mi SW of Starr
SV-316	S	FW	Big Generostee Creek at Co. road 104
SV-101	BIO	FW	Big Generostee Creek at SC 187
SV-109	BIO	FW	Little Generostee Creek at SC 184
SV-098	P	FW	Lake Russell at SC 72, 3.1 mi SW Calhoun Falls
03060103-070			
SV-031	P	FW	Rocky River at S-04-263, 2.7 mi SE Anderson at STP
SV-041	S	FW	Rocky River at S-04-152 below Rocky River STP
SV-139	S	FW	Cupboard Ck at S-04-733above Breazeale St Plt & below Blair Hill
SV-140	S	FW	Cupboard Ck at S-04-209 below effluent from Belton 2 plant
SV-141	S/BIO	FW	Broadway Creek at US 76 between Anderson & Belton
SV-319	W	FW	Broadway Lake, Broadway Creek arm upstream of public access
SV-258	W	FW	Broadway Lake, Neals Creek arm ½ between banks at golf course
SV-321	W	FW	Broadway Lake forebay, ½ between spillway and opposite land
SV-346	W	FW	Rocky River at S-04-244
SV-037	S	FW	Betsy Creek at S-04-259 below fiberglas outfall
SV-650	BIO	FW	Rocky River at SC 413
SV-043	S	FW	Cherokee Creek at S-04-318, 4 mi S of Belton
SV-044	BIO	FW	Hencoop Creek at S-04-244
SV-331	P	FW	Lake Secession, 1¼ mi below SC 28
SV-332	P	FW	Lake Secession approx. 400 yds above dam
SV-357	W	FW	Lake Russell, Rocky River arm between markers 48 & 49
03060103-080			
SV-185	BIO	FW	Wilson Creek at SC 413
SV-347	W	FW	Wilson Creek at S-04-294
03060103-100			
CL-040	W	FW	Lake Thurmond Headwaters (Savannah River)
SV-291	P	FW	Lake Thurmond at US 378, 7 mi SW of McCormick
CL-041	W	FW	Lake Thurmond in Forebay near dam
03060103-140			
SV-164	W/BIO	FW	Little River at S-01-24
SV-733	BIO	FW	Hogskin Creek at SC 184
SV-348	W/BIO	FW	Little River at S-01-32
SV-644	BIO	FW	Gill Creek at S-01-32
SV-052	P	FW	Sawney Creek at Co. Rd 1.5 mi SE of Calhoun Falls
SV-171	BIO	FW	Calhoun Creek at S-01-40
SV-192	W/BIO	FW	Little River at S-01-19
CL-039	W	FW	Little River arm of Lake Thurmond
03060103-150			
SV-349	W/BIO	FW	Long Cane Creek at S-01-159
SV-734	BIO	FW	Johns Creek at S-01-159
SV-053B	S	FW	Blue Hill Creek on S Main St Abbeville

Station #	Type	Class	Description
03060103-150 (Continued)			
SV-054	BIO	FW	Double Branch at S-01-33
SV-732	BIO	FW	Big Curly Tail Creek at US forest rd 509
SV-318	W	FW	Long Cane Creek at S-33-117, 7 mi NW McCormick

For further details concerning sampling frequency and parameters sampled, please visit our website at *www.scdhec.gov/eqc/admin/html/eqcpubs.html#wqreports* for the current State of S.C. Monitoring Strategy.

Water Quality Data

Spreadsheet Legend

Station Information:

STATION NUMBER Station ID

TYPE SCDHEC station type code

P = Primary station, sampled monthly all year round
S = Secondary station, sampled monthly May - October
P* = Secondary station upgraded to primary station parameter coverage and sampling frequency for ba
W = Special watershed station added for the Savannah River Basin study
BIO = Indicates macroinvertebrate community data assessed

WATERBODY NAME Stream or Lake Name

CLASS Stream classification at the point where monitoring station is located

Parameter Abbreviations and Parameter Measurement Units:

DO	Dissolved Oxygen (mg/l)	NH3	Ammonia (mg/l)
BOD	Five-Day Biochemical Oxygen Demand (mg/l)	CD	Cadmium (ug/l)
pH	pH (SU)	CR	Chromium (ug/l)
TP	Total Phosphorus (mg/l)	CU	Copper (ug/l)
TN	Total Nitrogen (mg/l)	PB	Lead (ug/l)
TURB	Turbidity (NTU)	HG	Mercury (ug/l)
TSS	Total Suspended Solids (mg/l)	NI	Nickel (ug/l)
BACT	Fecal Coliform Bacteria (#/100 ml)	ZN	Zinc (ug/l)

Statistical Abbreviations:

N For standards compliance, number of surface samples collected between January 1996 and December 2000.
For trends, number of surface samples collected between January 1984 and December 2000.
For total phosphorus, an additional trend period of January 1992 to December 2000 is also reported.

EXC. Number of samples contravening the appropriate standard

% Percentage of samples contravening the appropriate standard

MEAN EXC. Mean of samples that contravened the applied standard

MED For heavy metals with a human health criterion, this is the median of all surface samples between January 1996 and December 2000. DL indicates that the median was the detection limit.

MAG Magnitude of any statistically significant trend, average change per year, expressed in parameter measurement units

GEO MEAN Geometric mean of fecal coliform bacteria samples collected between January 1996 and December 2000

Key to Trends:

D Statistically significant decreasing trend in parameter concentration
I Statistically significant increasing trend in parameter concentration
* No statistically significant trend
Blank Insufficient data to test for long term trends

UPPER SAVANNAH RIVER BASIN WATER QUALITY SUMMARY

STATION				DO	DO	DO	MEAN	TRENDS (86 -2000)					
NUMBER	TYPE	WATERBODY NAME	CLASS	N	EXC.	%	EXC.	DO	N	MAG	BOD	N	MAG
03060103020													
SV-340	P	LAKE HARTWELL	FW	59	0	0		*	124	0.000	D	111	-0.035
03060103030													
SV-316	S	BIG GENEROSTEE CK	FW	31	1	3	4.60	I	85	0.145	D	84	-0.198
SV-101	BIO	BIG GENEROSTEE CK	FW										
SV-100	P	LAKE RUSSELL	FW	59	6	10	4.450	D	177	-0.027	D	177	-0.029
SV-109	BIO	LITTLE GENEROSITEE CK	FW										
SV-098	P	LAKE RUSSELL	FW	72	0	0		*	194	0.000	D	173	-0.057
03060103070													
SV-031	P	ROCKY RVR	FW	59	1	2	4.90	*	181	0.000	*	176	-0.013
SV-041	P*	ROCKY RVR	FW	41	0	0		I	100	0.161	D	95	-0.300
SV-139	S	CUPBOARD CK	FW	28	9	32	3.952	*	80	-0.045	D	81	-0.288
SV-140	S	CUPBOARD CK	FW	28	0	0		I	82	0.216	D	82	-0.334
SV-141	S/BIO	BROADWAY CK	FW	29	0	0		*	100	0.021	D	84	-0.049
SV-319	SS	LAKE, BROADWAY	FW	20	0	0							
SV-258	SS	LAKE, BROADWAY	FW	20	0	0							
SV-321	SS	LAKE, BROADWAY	FW	21	1	5	2.02						
SV-346	SS	ROCKY RVR	FW	24	0	0							
SV-037	S	BETSY CK	FW	16	0	0		D	58	-0.064	*	40	-0.150
SV-650	BIO	ROCKY RVR	FW										
SV-043	S	CHEROKEE CK	FW	28	0	0		I	81	0.143	D	81	-0.100
SV-044	BIO	HENCOOP CK	FW										
SV-331	P	LAKE SECESSION	FW	70	0	0		*	156	-0.069	D	120	-0.050
SV-332	P	LAKE SECESSION	FW	70	0	0		*	151	-0.024	D	118	-0.050
SV-357	SS	LAKE RUSSELL	FW	18	0	0							
03060103080													
SV-185	BIO	WILSON CK	FW										
SV-347	SS	WILSON CK	FW	24	0	0							
03060103100													
CL-040	SS*	LAKE, CLARKS HILL RESERVOIR	FW	10	0	0							
SV-291	P	LAKE, CLARKS HILL RESERVOIR	FW	58	0	0		*	177	0.010	D	174	-0.045
CL-041	SS*	LAKE, CLARKS HILL RESERVOIR	FW	9	0	0							

UPPER SAVANNAH RIVER BASIN WATER QUALITY SUMMARY

STATION				pH	pH	pH	MEAN	TRENDS (86-2000)			TURB	TURB	TURB	MEAN	TRENDS (86-2000)		
NUMBER	TYPE	WATERBODY NAME	CLASS	N	EXC.	%	EXC.	PH	N	MAG	N	EXC.	%	EXC.	TURB	N	MAG
03060103020																	
SV-340	P	LAKE HARTWELL	FW	59	1	2	8.69	I	123	0.045	47	0	0		D	111	-0.051
03060103030																	
SV-316	S	BIG GENEROSTEE CK	FW	31	0	0		*	84	0.000	29	1	3	55	D	80	-0.621
SV-101	BIO	BIG GENEROSTEE CK	FW														
SV-100	P	LAKE RUSSELL	FW	59	6	10	6.063	*	175	0.006	57	1	2	150	D	174	-0.055
SV-109	BIO	LITTLE GENEROSITEE CK	FW														
SV-098	P	LAKE RUSSELL	FW	69	3	4	8.657	I	186	0.014	54	0	0		D	171	-0.033
03060103070																	
SV-031	P	ROCKY RVR	FW	59	4	7	5.550	D	179	-0.012	57	5	9	120.0	I	174	0.500
SV-041	P*	ROCKY RVR	FW	41	0	0		*	99	0.000	39	4	10	85.0	*	92	0.249
SV-139	S	CUPBOARD CK	FW	28	2	7	5.765	D	80	-0.105	27	0	0		I	79	0.665
SV-140	S	CUPBOARD CK	FW	28	2	7	5.705	D	81	-0.031	27	0	0		I	80	0.624
SV-141	S/BIO	BROADWAY CK	FW	30	0	0		*	99	-0.006	29	2	7	215.0	*	82	-0.334
SV-319	SS	LAKE, BROADWAY	FW	20	0	0					20	0	0				
SV-258	SS	LAKE, BROADWAY	FW	20	0	0					20	0	0				
SV-321	SS	LAKE, BROADWAY	FW	21	0	0					21	0	0				
SV-346	SS	ROCKY RVR	FW	24	0	0					25	2	8	122.5			
SV-037	S	BETSY CK	FW	16	1	6	8.78	*	57	0.005	4	0	0		*	39	-0.390
SV-650	BIO	ROCKY RVR	FW														
SV-043	S	CHEROKEE CK	FW	28	0	0		I	80	0.025	27	1	4	180	D	79	-0.565
SV-044	BIO	HENCOOP CK	FW														
SV-331	P	LAKE SECESSION	FW	71	14	20	8.806	I	152	0.025	52	4	8	71.3	*	117	-0.017
SV-332	P	LAKE SECESSION	FW	72	1	1	9.02	I	148	0.049	52	5	10	71.6	D	115	-0.065
SV-357	SS	LAKE RUSSELL	FW	19	3	16	8.763				19	0	0				
03060103080																	
SV-185	BIO	WILSON CK	FW														
SV-347	SS	WILSON CK	FW	24	1	4	5.90				24	0	0				
03060103100																	
CL-040	SS*	LAKE, CLARKS HILL RESERVOIR	FW	9	1	11	5.57				6	0	0				
SV-291	P	LAKE, CLARKS HILL RESERVOIR	FW	58	1	2	5.55	D	176	-0.044	58	3	5	64.7	*	177	0.050
CL-041	SS*	LAKE, CLARKS HILL RESERVOIR	FW	8	1	13	5.79				6	0	0				

UPPER SAVANNAH RIVER BASIN WATER QUALITY SUMMARY

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	TP N	TP EXC.	TP %	MEAN EXC.	TRENDS (92-2000) TP	TRENDS (92-2000) N	TRENDS (92-2000) MAG	TRENDS (86-2000) TP	TRENDS (86-2000) N	TRENDS (86-2000) MAG
03060103020													
SV-340	P	LAKE HARTWELL	FW	23	0	0		*	66	0.000	*	84	0.000
03060103030													
SV-316	S	BIG GENEROSTEE CK	FW								D	63	-0.050
SV-101	BIO	BIG GENEROSTEE CK	FW										
SV-100	P	LAKE RUSSELL	FW	29	3	10	0.073	*	73	0.000	*	143	0.000
SV-109	BIO	LITTLE GENEROSITEE CK	FW										
SV-098	P	LAKE RUSSELL	FW	25	0	0		I	69	0.000	*	137	0.000
03060103070													
SV-031	P	ROCKY RVR	FW					*	73	0.000	*	144	0.000
SV-041	P*	ROCKY RVR	FW					*	33	-0.005	D	73	-0.044
SV-139	S	CUPBOARD CK	FW								D	64	-0.165
SV-140	S	CUPBOARD CK	FW					D	31	-0.538	D	65	-0.127
SV-141	S/BIO	BROADWAY CK	FW					*	48	0.000	D	83	-0.002
SV-319	SS	LAKE, BROADWAY	FW	5	0	0							
SV-258	SS	LAKE, BROADWAY	FW	4	0	0							
SV-321	SS	LAKE, BROADWAY	FW	5	0	0							
SV-346	SS	ROCKY RVR	FW										
SV-037	S	BETSY CK	FW								*	39	-0.013
SV-650	BIO	ROCKY RVR	FW										
SV-043	S	CHEROKEE CK	FW								D	64	-0.018
SV-044	BIO	HENCOOP CK	FW										
SV-331	P	LAKE SECESSION	FW	24	11	46	0.095	*	69	-0.002	*	90	0.000
SV-332	P	LAKE SECESSION	FW	24	3	13	0.087	I	66	0.000	*	87	0.000
SV-357	SS	LAKE RUSSELL	FW	6	0	0							
03060103080													
SV-185	BIO	WILSON CK	FW										
SV-347	SS	WILSON CK	FW										
03060103100													
CL-040	SS*	LAKE, CLARKS HILL RESERVOIR	FW										
SV-291	P	LAKE, CLARKS HILL RESERVOIR	FW	27	6	22	0.088	*	70	0.000	*	139	0.000
CL-041	SS*	LAKE, CLARKS HILL RESERVOIR	FW										

UPPER SAVANNAH RIVER BASIN WATER QUALITY SUMMARY

STATION				TN	TN	TN	MEAN	TRENDS (86-2000)			CHL	CHL	CHL	MEAN	TRENDS (86-2000)		
NUMBER	TYPE	WATERBODY NAME	CLASS	N	EXC.	%	EXC.	TN	N	MAG	N	EXC.	%	EXC.	TSS	N	MAG
03060103020																	
SV-340	P	LAKE HARTWELL	FW	46	0	0		*	107	-0.003	21	0	0				
03060103030																	
SV-316	S	BIG GENEROSTEE CK	FW														
SV-101	BIO	BIG GENEROSTEE CK	FW														
SV-100	P	LAKE RUSSELL	FW	58	0	0		D	171	-0.004							
SV-109	BIO	LITTLE GENEROSITEE CK	FW														
SV-098	P	LAKE RUSSELL	FW	55	0	0		D	167	-0.016	23	0	0				
03060103070																	
SV-031	P	ROCKY RVR	FW					*	174	-0.002							
SV-041	P*	ROCKY RVR	FW					I	30	0.113							
SV-139	S	CUPBOARD CK	FW														
SV-140	S	CUPBOARD CK	FW														
SV-141	S/BIO	BROADWAY CK	FW														
SV-319	SS	LAKE, BROADWAY	FW	19	0	0					10	0	0				
SV-258	SS	LAKE, BROADWAY	FW	18	0	0					10	0	0				
SV-321	SS	LAKE, BROADWAY	FW	18	0	0					10	0	0				
SV-346	SS	ROCKY RVR	FW														
SV-037	S	BETSY CK	FW														
SV-650	BIO	ROCKY RVR	FW														
SV-043	S	CHEROKEE CK	FW														
SV-044	BIO	HENCOOP CK	FW														
SV-331	P	LAKE SECESSION	FW	53	1	2	1.65	*	119	0.000	21	3	14	87.73			
SV-332	P	LAKE SECESSION	FW	52	0	0		*	115	-0.002	18	0	0				
SV-357	SS	LAKE RUSSELL	FW	20	0	0					11	0	0				
03060103080																	
SV-185	BIO	WILSON CK	FW														
SV-347	SS	WILSON CK	FW														
03060103100																	
CL-040	SS*	LAKE, CLARKS HILL RESERVOIR	FW	6	0	0					10	0	0				
SV-291	P	LAKE, CLARKS HILL RESERVOIR	FW	58	1	2	2.07	D	170	-0.004					*	146	0.000
CL-041	SS*	LAKE, CLARKS HILL RESERVOIR	FW	6	0	0					9	0	0				

UPPER SAVANNAH RIVER BASIN WATER QUALITY SUMMARY

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	GEO MEAN	BACT N	BACT EXC.	BACT %	MEAN EXC.	TRENDS (86-2000) BACT	N	MAG	NH3 N	NH3 EXC.	NH3 %	CD N	CD EXC.	CD %	MEAN EXC.
03060103020																		
SV-340	P	LAKE HARTWELL	FW	1	48	0	0		D	112	0.000	44	0	0	15	0	0	
03060103030																		
SV-316	S	BIG GENEROSTEE CK	FW	610	30	19	63	2155	I	84	25.718							
SV-101	BIO	BIG GENEROSTEE CK	FW															
SV-100	P	LAKE RUSSELL	FW	4	57	0	0		D	175	-0.111	57	0	0	19	0	0	
SV-109	BIO	LITTLE GENEROSITEE CK	FW															
SV-098	P	LAKE RUSSELL	FW	1	56	0	0		D	173	-0.125	52	0	0	20	0	0	
03060103070																		
SV-031	P	ROCKY RVR	FW	252	58	16	28	1019	I	176	10.012	57	0	0	19	0	0	
SV-041	P*	ROCKY RVR	FW	233	40	9	23	1674	I	95	14.598	24	0	0	8	0	0	
SV-139	S	CUPBOARD CK	FW	655	28	15	54	4791	*	81	11.343							
SV-140	S	CUPBOARD CK	FW	518	28	17	61	1826	I	82	26.762							
SV-141	S/BIO	BROADWAY CK	FW	305	30	8	27	1356	*	84	7.027	1	0	0				
SV-319	SS	LAKE, BROADWAY	FW	24	19	0	0					19	0	0	5	0	0	
SV-258	SS	LAKE, BROADWAY	FW	14	19	0	0					18	0	0	5	0	0	
SV-321	SS	LAKE, BROADWAY	FW	9	21	0	0					18	0	0	5	0	0	
SV-346	SS	ROCKY RVR	FW	113	22	1	5	9000				23	0	0	7	0	0	
SV-037	S	BETSY CK	FW	234	3	1	33	640	I	39	43.558	1	0	0	9	0	0	
SV-650	BIO	ROCKY RVR	FW															
SV-043	S	CHEROKEE CK	FW	464	28	12	43	2794	I	80	19.624							
SV-044	BIO	HENCOOP CK	FW															
SV-331	P	LAKE SECESSION	FW	38	54	3	6	1767	*	119	0.000	52	0	0	18	0	0	
SV-332	P	LAKE SECESSION	FW	4	54	0	0		*	117	0.000	52	0	0	18	0	0	
SV-357	SS	LAKE RUSSELL	FW	2	19	0	0					20	0	0	6	0	0	
03060103080																		
SV-185	BIO	WILSON CK	FW															
SV-347	SS	WILSON CK	FW	228	24	5	21	534				22	0	0	7	0	0	
03060103100																		
CL-040	SS*	LAKE, CLARKS HILL RESERVOIR	FW	1	6	0	0					6	0	0				
SV-291	P	LAKE, CLARKS HILL RESERVOIR	FW	7	58	0	0		*	176	0.000	57	0	0	20	0	0	
CL-041	SS*	LAKE, CLARKS HILL RESERVOIR	FW	0	6	0	0					6	0	0				

UPPER SAVANNAH RIVER BASIN WATER QUALITY SUMMARY

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	CR N	CR EXC.	CR %	MEAN EXC.	CU N	CU EXC.	CU %	MEAN EXC.	PB N	PB EXC.	PB %	MEAN EXC.	HG N	HG EXC.	HG %
03060103020																		
SV-340	P	LAKE HARTWELL	FW	15	0	0		15	1	7	20	15	0	0		15	0	0
03060103030																		
SV-316	S	BIG GENEROSTEE CK	FW															
SV-101	BIO	BIG GENEROSTEE CK	FW															
SV-100	P	LAKE RUSSELL	FW	19	0	0		19	0	0		19	0	0		19	0	0
SV-109	BIO	LITTLE GENEROSITEE CK	FW															
SV-098	P	LAKE RUSSELL	FW	20	0	0		20	0	0		20	0	0		20	0	0
03060103070																		
SV-031	P	ROCKY RVR	FW	19	0	0		19	0	0		19	1	5	100	19	0	0
SV-041	P*	ROCKY RVR	FW	8	0	0		8	0	0		8	0	0		8	0	0
SV-139	S	CUPBOARD CK	FW															
SV-140	S	CUPBOARD CK	FW															
SV-141	S/BIO	BROADWAY CK	FW															
SV-319	SS	LAKE, BROADWAY	FW	5	0	0		5	0	0		5	0	0		5	0	0
SV-258	SS	LAKE, BROADWAY	FW	5	0	0		5	0	0		5	0	0		5	0	0
SV-321	SS	LAKE, BROADWAY	FW	5	0	0		5	0	0		5	0	0		5	0	0
SV-346	SS	ROCKY RVR	FW	7	0	0		7	1	14	20	7	0	0		7	0	0
SV-037	S	BETSY CK	FW	9	0	0		9	2	22	20.0	9	0	0		9	0	0
SV-650	BIO	ROCKY RVR	FW															
SV-043	S	CHEROKEE CK	FW															
SV-044	BIO	HENCOOP CK	FW															
SV-331	P	LAKE SECESSION	FW	18	0	0		18	1	6	20	18	0	0		18	0	0
SV-332	P	LAKE SECESSION	FW	18	0	0		18	1	6	20	18	0	0		18	0	0
SV-357	SS	LAKE RUSSELL	FW	6	0	0		6	0	0		6	0	0		6	0	0
03060103080																		
SV-185	BIO	WILSON CK	FW															
SV-347	SS	WILSON CK	FW	7	0	0		7	0	0		7	0	0		7	0	0
03060103100																		
CL-040	SS*	LAKE, CLARKS HILL RESERVOIR	FW															
SV-291	P	LAKE, CLARKS HILL RESERVOIR	FW	20	0	0		20	0	0		20	0	0		20	0	0
CL-041	SS*	LAKE, CLARKS HILL RESERVOIR	FW															

UPPER SAVANNAH RIVER BASIN WATER QUALITY SUMMARY

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	NI N	NI EXC.	NI %	MEAN EXC.	ZN N	ZN EXC.	ZN %	MEAN EXC.
03060103020											
SV-340	P	LAKE HARTWELL	FW	15	0	0		15	0	0	
03060103030											
SV-316	S	BIG GENEROSTEE CK	FW								
SV-101	BIO	BIG GENEROSTEE CK	FW								
SV-100	P	LAKE RUSSELL	FW	19	0	0		19	0	0	
SV-109	BIO	LITTLE GENEROSITEE CK	FW								
SV-098	P	LAKE RUSSELL	FW	20	0	0		20	0	0	
03060103070											
SV-031	P	ROCKY RVR	FW	19	0	0		19	0	0	
SV-041	P*	ROCKY RVR	FW	8	0	0		8	0	0	
SV-139	S	CUPBOARD CK	FW								
SV-140	S	CUPBOARD CK	FW								
SV-141	S/BIO	BROADWAY CK	FW								
SV-319	SS	LAKE, BROADWAY	FW	5	0	0		5	0	0	
SV-258	SS	LAKE, BROADWAY	FW	5	0	0		5	0	0	
SV-321	SS	LAKE, BROADWAY	FW	5	0	0		5	0	0	
SV-346	SS	ROCKY RVR	FW	7	0	0		7	0	0	
SV-037	S	BETSY CK	FW	9	0	0		9	1	11	130
SV-650	BIO	ROCKY RVR	FW								
SV-043	S	CHEROKEE CK	FW								
SV-044	BIO	HENCOOP CK	FW								
SV-331	P	LAKE SECESSION	FW	18	0	0		18	0	0	
SV-332	P	LAKE SECESSION	FW	18	0	0		18	0	0	
SV-357	SS	LAKE RUSSELL	FW	6	0	0		6	1	17	110
03060103080											
SV-185	BIO	WILSON CK	FW								
SV-347	SS	WILSON CK	FW	7	0	0		7	0	0	
03060103100											
CL-040	SS*	LAKE, CLARKS HILL RESERVOIR	FW								
SV-291	P	LAKE, CLARKS HILL RESERVOIR	FW	20	0	0		20	0	0	
CL-041	SS*	LAKE, CLARKS HILL RESERVOIR	FW								

UPPER SAVANNAH RIVER BASIN WATER QUALITY SUMMARY

STATION				DO	DO	DO	MEAN	TRENDS (86 -2000)					
NUMBER	TYPE	WATERBODY NAME	CLASS	N	EXC.	%	EXC.	DO	N	MAG	BOD	N	MAG
03060103140													
SV-164	SS/BIO	LITTLE RVR	FW	24	0	0							
SV-733	BIO	HOGSKIN CK	FW										
SV-348	SS/BIO	LITTLE RVR	FW	24	0	0							
SV-644	BIO	GILL CK	FW										
SV-052	P	SAWNEY CK	FW	55	6	11	4.100	D	133	-0.076	*	134	0.000
SV-171	BIO	CALHOUN CK	FW										
SV-192	SS/BIO	LITTLE RVR	FW	24	0	0							
CL-039	SS*	LAKE, CLARKS HILL RESERVOIR	FW	10	0	0							
03060103150													
SV-349	SS/BIO	LONG CANE CK	FW	24	0	0							
SV-734	BIO	JOHNS CK	FW										
SV-053B	S	BLUE HILL CK	FW	27	0	0		I	80	0.070	*	79	0.015
SV-054	BIO	DOUBLE BR	FW										
SV-732	BIO	BIG CURLY TAIL CK	FW										
SV-318	P/BIO	LONG CANE CK	FW	59	0	0		I	179	0.029	*	174	0.000

UPPER SAVANNAH RIVER BASIN WATER QUALITY SUMMARY

STATION				pH	pH	pH	MEAN	TRENDS (86-2000)			TURB	TURB	TURB	MEAN	TRENDS (86-2000)		
NUMBER	TYPE	WATERBODY NAME	CLASS	N	EXC.	%	EXC.	PH	N	MAG	N	EXC.	%	EXC.	TURB	N	MAG
03060103140																	
SV-164	SS/BIO	LITTLE RVR	FW	24	2	8	5.675				24	0	0				
SV-733	BIO	HOGSKIN CK	FW														
SV-348	SS/BIO	LITTLE RVR	FW	24	0	0					24	4	17	62.0			
SV-644	BIO	GILL CK	FW														
SV-052	P	SAWNEY CK	FW	54	0	0		D	131	-0.050	53	1	2	61	D	130	-0.316
SV-171	BIO	CALHOUN CK	FW														
SV-192	SS/BIO	LITTLE RVR	FW	24	1	4	5.90				24	2	8	126.0			
CL-039	SS*	LAKE, CLARKS HILL RESERVOIR	FW	9	0	0					6	0	0				
03060103150																	
SV-349	SS/BIO	LONG CANE CK	FW	24	2	8	5.900				24	1	4	54			
SV-734	BIO	JOHNS CK	FW														
SV-053B	S	BLUE HILL CK	FW	27	0	0		D	79	-0.017	24	7	29	63.1	*	75	-0.512
SV-054	BIO	DOUBLE BR	FW														
SV-732	BIO	BIG CURLY TAIL CK	FW														
SV-318	P/BIO	LONG CANE CK	FW	59	1	2	8.60	D	178	-0.019	59	9	15	94.1	*	178	0.262

UPPER SAVANNAH RIVER BASIN WATER QUALITY SUMMARY

STATION					TP	TP	TP	MEAN	TRENDS (92-2000)				TRENDS (86-2000)		
NUMBER	TYPE	WATERBODY NAME	CLASS		N	EXC.	%	EXC.	TP	N	MAG		TP	N	MAG
03060103140															
SV-164	SS/BIO	LITTLE RVR	FW												
SV-733	BIO	HOGSKIN CK	FW												
SV-348	SS/BIO	LITTLE RVR	FW												
SV-644	BIO	GILL CK	FW												
SV-052	P	SAWNEY CK	FW						*	62	0.002		D	98	-0.012
SV-171	BIO	CALHOUN CK	FW												
SV-192	SS/BIO	LITTLE RVR	FW												
CL-039	SS*	LAKE, CLARKS HILL RESERVOIR	FW												
03060103150															
SV-349	SS/BIO	LONG CANE CK	FW												
SV-734	BIO	JOHNS CK	FW												
SV-053B	S	BLUE HILL CK	FW										D	62	-0.044
SV-054	BIO	DOUBLE BR	FW												
SV-732	BIO	BIG CURLY TAIL CK	FW												
SV-318	P/BIO	LONG CANE CK	FW						*	74	-0.004		D	142	-0.005

UPPER SAVANNAH RIVER BASIN WATER QUALITY SUMMARY

STATION				TN	TN	TN	MEAN	TRENDS (86-2000)			CHL	CHL	CHL	MEAN	TRENDS (86-2000)		
NUMBER	TYPE	WATERBODY NAME	CLASS	N	EXC.	%	EXC.	TN	N	MAG	N	EXC.	%	EXC.	TSS	N	MAG
03060103140																	
SV-164	SS/BIO	LITTLE RVR	FW														
SV-733	BIO	HOGSKIN CK	FW														
SV-348	SS/BIO	LITTLE RVR	FW														
SV-644	BIO	GILL CK	FW														
SV-052	P	SAWNEY CK	FW					I	93	0.070							
SV-171	BIO	CALHOUN CK	FW														
SV-192	SS/BIO	LITTLE RVR	FW														
CL-039	SS*	LAKE, CLARKS HILL RESERVOIR	FW	6	0	0					11	1	9	43.7			
03060103150																	
SV-349	SS/BIO	LONG CANE CK	FW														
SV-734	BIO	JOHNS CK	FW														
SV-053B	S	BLUE HILL CK	FW														
SV-054	BIO	DOUBLE BR	FW														
SV-732	BIO	BIG CURLY TAIL CK	FW														
SV-318	P/BIO	LONG CANE CK	FW					D	171	-0.010							

UPPER SAVANNAH RIVER BASIN WATER QUALITY SUMMARY

STATION				GEO	BACT	BACT	BACT	MEAN	TRENDS (86-2000)			NH3	NH3	NH3	CD	CD	CD	MEAN
NUMBER	TYPE	WATERBODY NAME	CLASS	MEAN	N	EXC.	%	EXC.	BACT	N	MAG	N	EXC.	%	N	EXC.	%	EXC.
03060103140																		
SV-164	SS/BIO	LITTLE RVR	FW	295	24	5	21	666				22	0	0	7	0	0	
SV-733	BIO	HOGSKIN CK	FW															
SV-348	SS/BIO	LITTLE RVR	FW	263	24	7	29	696				22	0	0	7	0	0	
SV-644	BIO	GILL CK	FW															
SV-052	P	SAWNEY CK	FW	238	53	15	28	1187	I	131	6.350	52	0	0	17	0	0	
SV-171	BIO	CALHOUN CK	FW															
SV-192	SS/BIO	LITTLE RVR	FW	168	24	4	17	605				20	0	0	8	0	0	
CL-039	SS*	LAKE, CLARKS HILL RESERVOIR	FW	6	6	0	0					6	0	0				
03060103150																		
SV-349	SS/BIO	LONG CANE CK	FW	507	24	16	67	691				23	0	0	7	0	0	
SV-734	BIO	JOHNS CK	FW															
SV-053B	S	BLUE HILL CK	FW	454	26	17	65	4421	I	78	70.218							
SV-054	BIO	DOUBLE BR	FW															
SV-732	BIO	BIG CURLY TAIL CK	FW															
SV-318	P/BIO	LONG CANE CK	FW	83	59	3	5	600	D	177	-7.860	59	0	0	19	0	0	

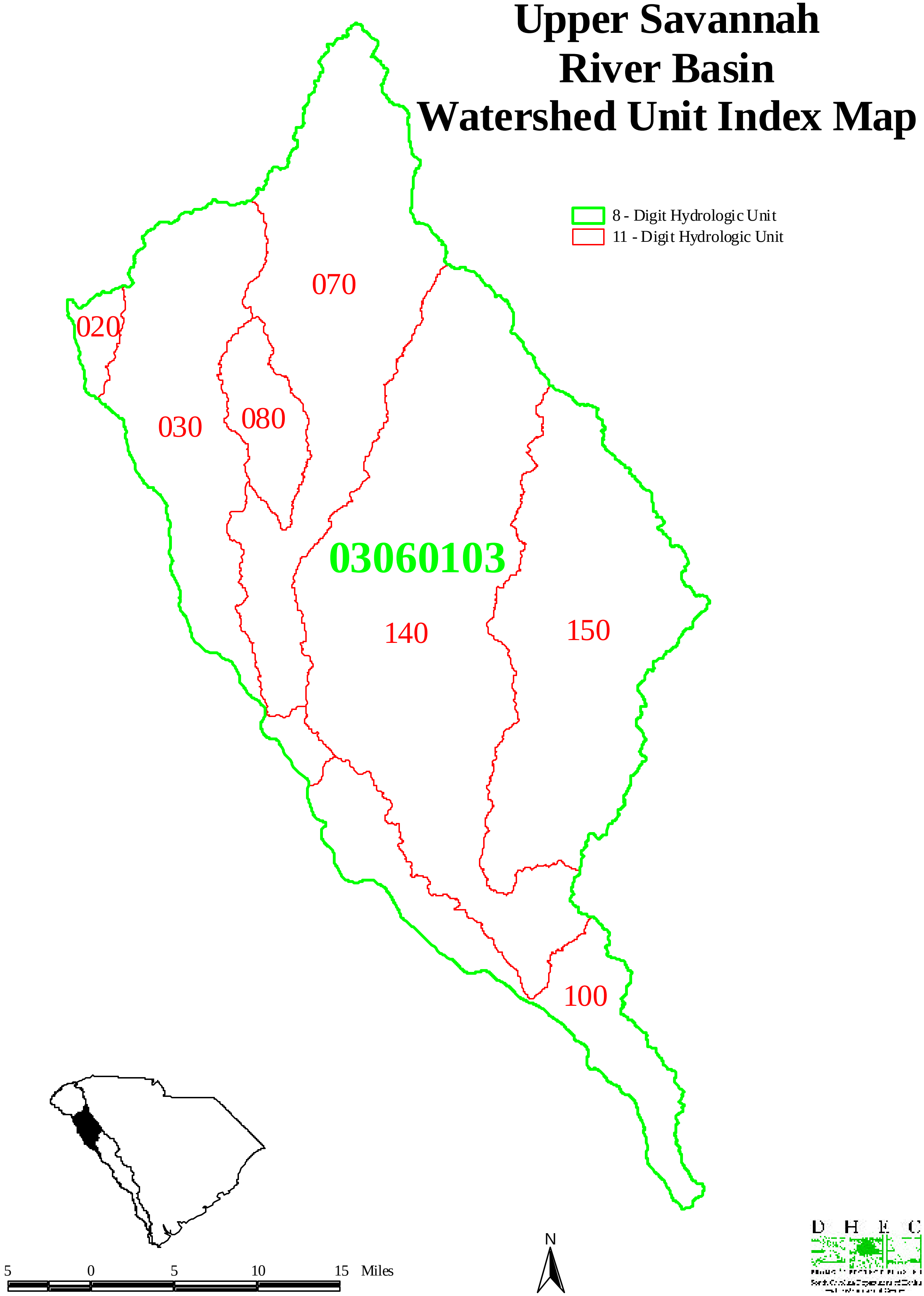
UPPER SAVANNAH RIVER BASIN WATER QUALITY SUMMARY

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	CR N	CR EXC.	CR %	MEAN EXC.	CU N	CU EXC.	CU %	MEAN EXC.	PB N	PB EXC.	PB %	MEAN EXC.	HG N	HG EXC.	HG %
03060103140																		
SV-164	SS/BIO	LITTLE RVR	FW	7	0	0		7	0	0		7	0	0		7	0	0
SV-733	BIO	HOGSKIN CK	FW															
SV-348	SS/BIO	LITTLE RVR	FW	7	0	0		7	0	0		7	0	0		7	0	0
SV-644	BIO	GILL CK	FW															
SV-052	P	SAWNEY CK	FW	17	0	0		17	0	0		17	0	0		17	0	0
SV-171	BIO	CALHOUN CK	FW															
SV-192	SS/BIO	LITTLE RVR	FW	8	0	0		8	0	0		8	0	0		8	0	0
CL-039	SS*	LAKE, CLARKS HILL RESERVOIR	FW															
03060103150																		
SV-349	SS/BIO	LONG CANE CK	FW	7	0	0		7	0	0		7	0	0		7	0	0
SV-734	BIO	JOHNS CK	FW															
SV-053B	S	BLUE HILL CK	FW															
SV-054	BIO	DOUBLE BR	FW															
SV-732	BIO	BIG CURLY TAIL CK	FW															
SV-318	P/BIO	LONG CANE CK	FW	19	0	0		19	1	5	40	19	0	0		19	0	0

UPPER SAVANNAH RIVER BASIN WATER QUALITY SUMMARY

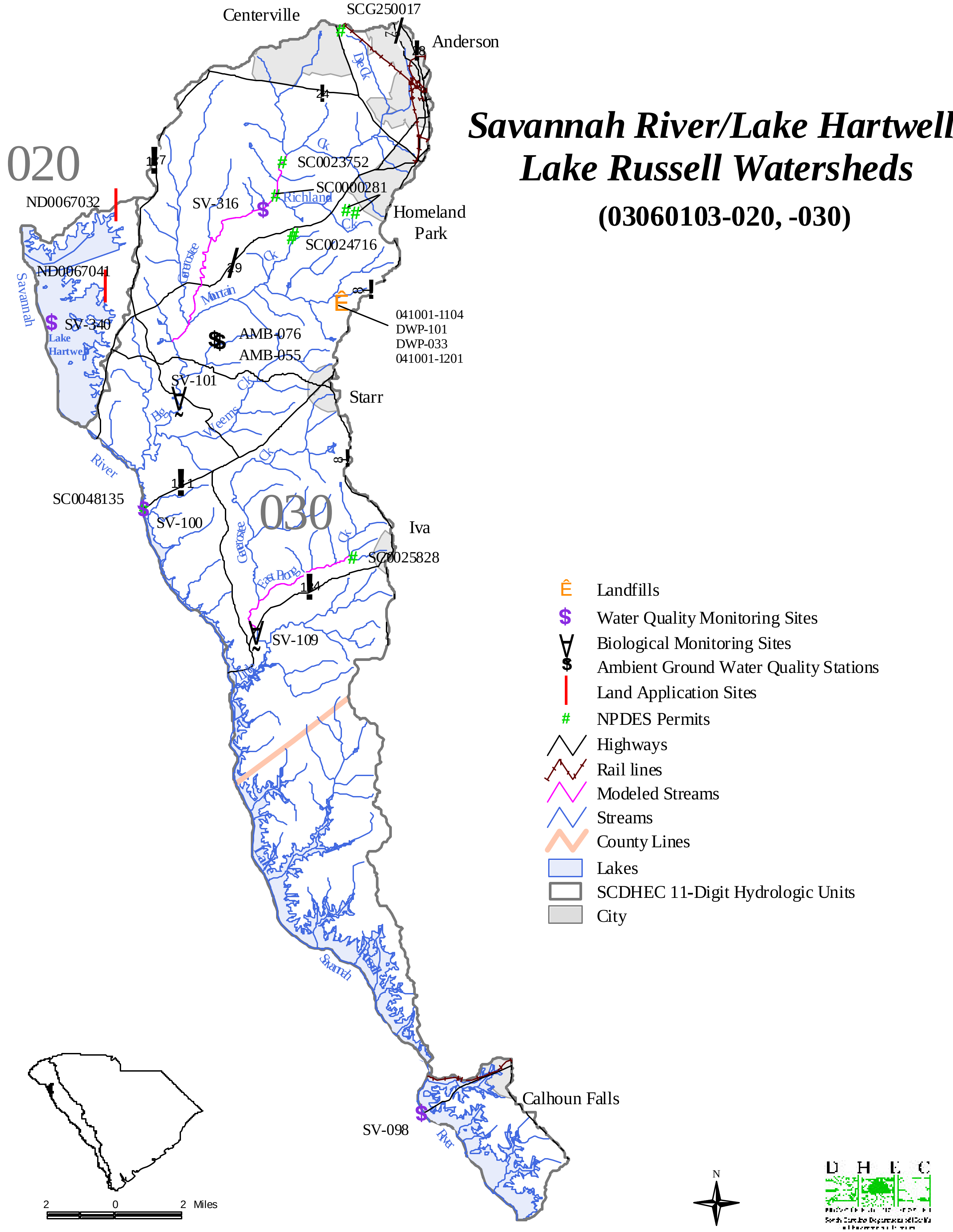
STATION NUMBER	TYPE	WATERBODY NAME	CLASS		NI N	NI EXC.	NI %	MEAN EXC.		ZN N	ZN EXC.	ZN %	MEAN EXC.
03060103140													
SV-164	SS/BIO	LITTLE RVR	FW		7	0	0			7	1	14	160
SV-733	BIO	HOGSKIN CK	FW										
SV-348	SS/BIO	LITTLE RVR	FW		7	0	0			7	0	0	
SV-644	BIO	GILL CK	FW										
SV-052	P	SAWNEY CK	FW		17	0	0			17	0	0	
SV-171	BIO	CALHOUN CK	FW										
SV-192	SS/BIO	LITTLE RVR	FW		8	0	0			8	0	0	
CL-039	SS*	LAKE, CLARKS HILL RESERVOIR	FW										
03060103150													
SV-349	SS/BIO	LONG CANE CK	FW		7	0	0			7	0	0	
SV-734	BIO	JOHNS CK	FW										
SV-053B	S	BLUE HILL CK	FW										
SV-054	BIO	DOUBLE BR	FW										
SV-732	BIO	BIG CURLY TAIL CK	FW										
SV-318	P/BIO	LONG CANE CK	FW		19	0	0			19	1	5	330

Upper Savannah River Basin Watershed Unit Index Map



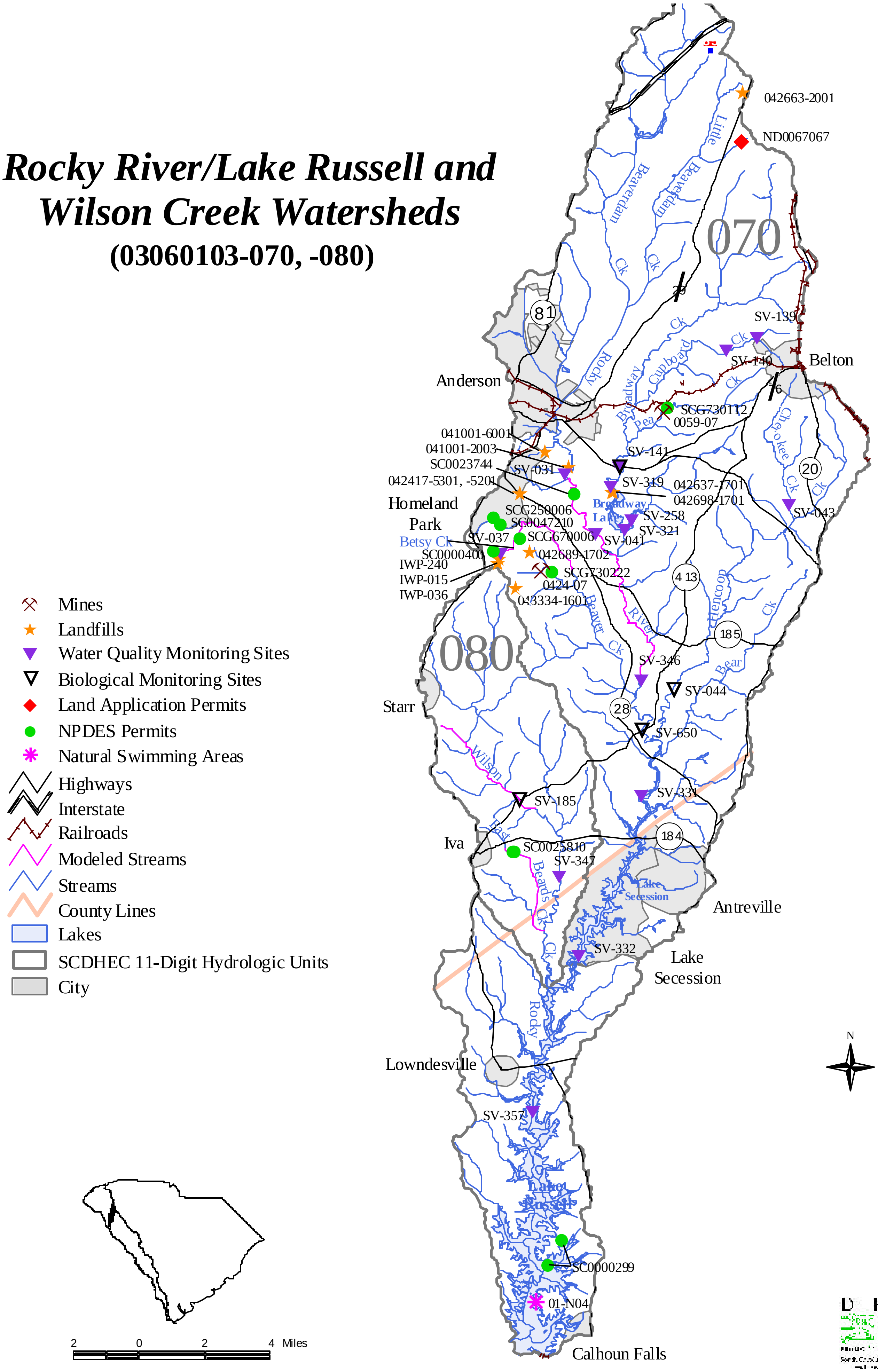
Savannah River/Lake Hartwell/ Lake Russell Watersheds

(03060103-020, -030)



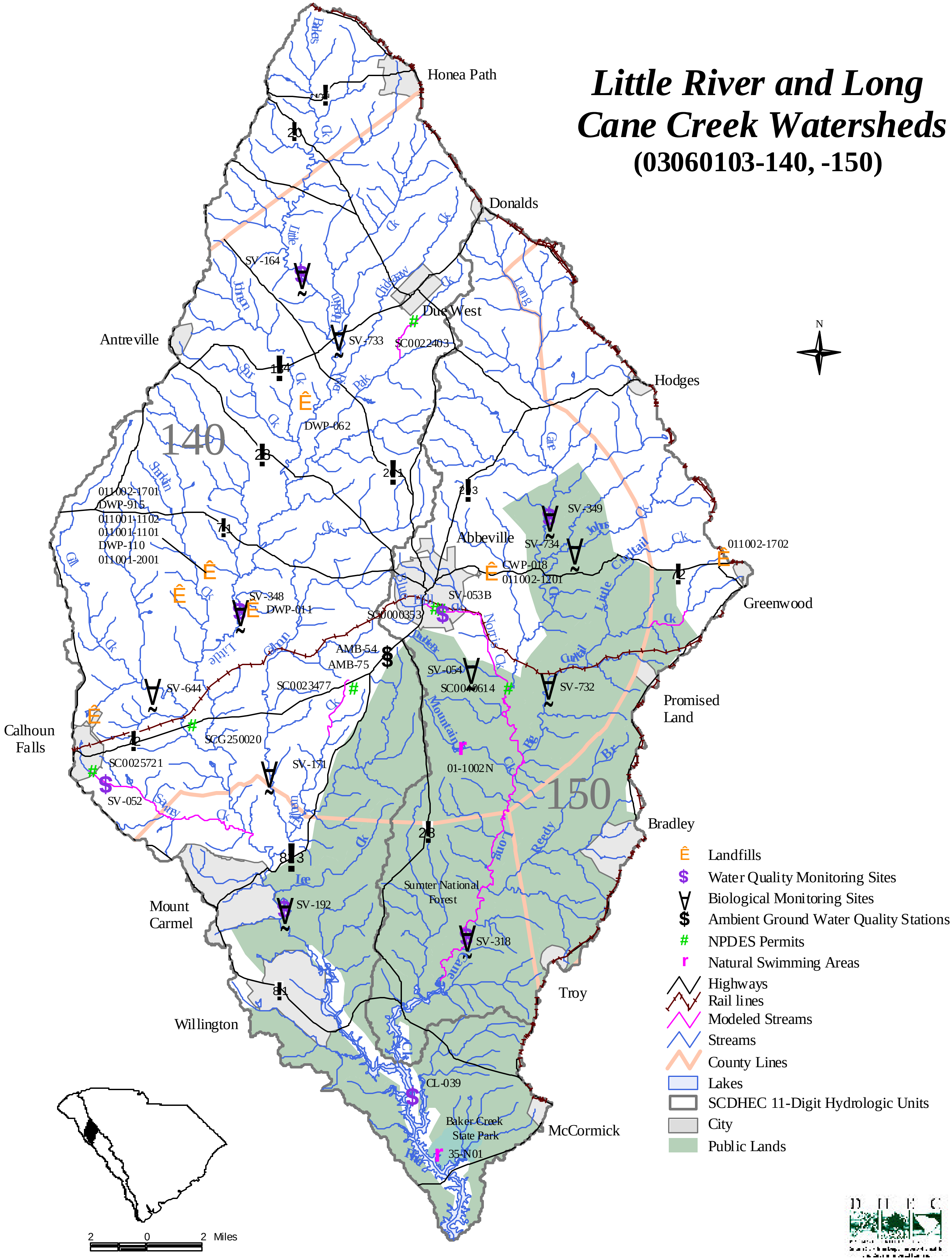
Rocky River/Lake Russell and Wilson Creek Watersheds

(03060103-070, -080)



Savannah River/Lake Strom Thurmond

(03060103-100)


Little River and Long Cane Creek Watersheds
(03060103-140, -150)
Honea Path
Donalds
Due West
Antreville
Hodges
Abbeville
Greenwood
Promised Land
Calhoun Falls
Bradley
Mount Carmel
Willington
Troy
McCormick
Sumter National Forest
Baker Creek State Park
140
150
N
SV-164
SV-733
SC0022403
DWP-062
011002-1701
DWP-915
011001-1102
011001-1101
DWP-110
011001-2001
SV-348
DWP-011
SV-349
SV-734
CWP-018
011002-1201
011002-1702
SV-053B
SC0000353
AMB-54
AMB-75
SV-054
SC0040614
SV-732
SC0023477
SV-644
SCG250020
SC0025721
SV-052
SV-171
01-1002N
SV-192
SV-318
CL-039
35-N01
Landfills
Water Quality Monitoring Sites
Biological Monitoring Sites
Ambient Ground Water Quality Stations
NPDES Permits
Natural Swimming Areas
Highways
Rail lines
Modeled Streams
Streams
County Lines
Lakes
SCDHEC 11-Digit Hydrologic Units
City
Public Lands
2 0 2 Miles

APPENDIX D.

Lower Savannah River Basin

Ambient Water Quality Monitoring Site Descriptions

Station #	Type	Class	Description
03060106-030			
SV-294	P	FW	STEVENS CREEK RES. HEADWATERS AT CLARKS HILL DAM BOAT RAMP
03060106-050			
SV-251	P	FW	SAVANNAH RIVER AT US 1, 1.5 MI SW N.AUGUSTA
SV-252	P	FW	SAVANNAH RIVER AT SC 28, 1.6 MI NNW OF BEECH ISLAND
SV-323	P	FW	SAVANNAH RIVER AT LOCK AND DAM
03060106-060			
CL-067	W	FW	VAUCLUSE POND IN FOREBAY NEAR DAM
SV-686	W	FW	FLAT ROCK POND IN FOREBAY NEAR DAM
SV-722	W/BIO	FW	GRANITEVILLE POND #2 IN FOREBAY NEAR DAM
SV-329	P	FW	HORSE CREEK AT ASCAUGA LAKE RD (S-02-33) IN GRANITEVILLE
SV-071	P	FW	HORSE CREEK AT S-02-104, 0.6 MI SW GRANITEVILLE
SV-069	P	FW	SAND RIVER AT OLD US 1, 1.2 MI SE WARRENVILLE
CL-069	W/BIO	FW	LANGLEY POND IN FOREBAY NEAR DAM
SV-096	P	FW	HORSE CREEK BELOW LANGLEY POND AT S-02-254
SV-724	BIO	FW	LITTLE HORSE CREEK AT S-02-104
SV-073	S	FW	LITTLE HORSE CREEK AT SC 421, BELOW EFFL. OF CLEARWATER FINISHING
SV-072	S	FW	HORSE CREEK AT S-02-145
SV-250	P	FW	HORSE CREEK AT SC 125, 1.5MI SW CLEARWATER
03060106-070			
SV-350	W/BIO	FW	HOLLOW CREEK AT S-02-5
03060106-100			
SV-680	BIO	FW	UPPER THREE RUNS AT S-02-113
SV-723	BIO	FW	CEDAR CREEK AT S-02-79
SV-324	P	FW	TIMS BRANCH AT SRP ROAD C
SV-325	P	FW	UPPER THREE RUNS AT SRP ROAD A
03060106-110			
SV-326	P	FW	FOURMILE BRANCH AT SRP ROAD A-7
SV-327	P	FW	STEEL CREEK AT SRP ROAD A
03060106-130			
SV-328	P/BIO	FW	LOWER THREE RUNS AT S-0620, 7.5MI SW BARNWELL
SV-175	S	FW	LOWER THREE RUNS AT SC 125, 11MI NW ALLENDALE
03060106-140			
SV-118	P	FW	SAVANNAH RIVER AT US 301, 12.5 MI SW OF ALLENDALE
SV-745	BIO	FW	BRIER CREEK AT S-03-102
03060107-010			
SV-151	P/BIO	FW	HARD LABOR CREEK AT S-24-164 BRIDGE
SV-731	BIO	FW	HARD LABOR CREEK AT S-33-23
SV-351	W/BIO	FW	CUFFYTOWN CREEK AT S-33-138
SV-730	BIO	FW	ROCKY CREEK AT S-33-87
SV-330	W	FW	STEVENS CREEK AT S-33-21

Station # **Type** **Class** **Description**

03060107-020

SV-729	BIO	FW	TURKEY CREEK AT S-191-100
SV-728	BIO	FW	LOG CREEK AT S-19-315
SV-727	BIO	FW	ROCKY CREEK AT S-19-61
SV-352	W	FW	TURKEY CREEK AT S-33-227/S-19-68

03060107-030

SV-068	S	FW	BEAVERDAM CREEK AT S-19-35, 3.8 MI NW OF EDGEFIELD
SV-353	W/BIO	FW	BEAVERDAM CREEK AT FOREST SERVICE RD 621 OFF S-19-68

03060107-040

SV-063	BIO	FW	STEVENS CREEK AT SC 23
SV-354	W	FW	STEVENS CREEK AT S-33-88/S-19-143
SV-726	BIO	FW	HORN CREEK AT S-19-143
SV-725	BIO	FW	CHEVES CREEK AT S-19-34

03060109-020

NO WATER QUALITY MONITORING STATIONS IN THIS WATERSHED

03060109-050

SV-355	W	FW	SAVANNAH RIVER AT STOKES BLUFF LANDING OFF S-25-461

03060109-060

SV-744	BIO	FW	CYPRESS BRANCH AT US 321
SV-356	W	FW	CYPRESS CREEK AT S-27-119
SV-191	P	SB*	SAVANNAH RIVER AT US 17, 8.9MI SSW OF HARDEEVILLE

For further details concerning sampling frequency and parameters sampled, please visit our website at *www.scdhec.gov/eqc/admin/html/eqcpubs.html#wqreports* for the current State of S.C. Monitoring Strategy.

Water Quality Data

Spreadsheet Legend

Station Information:

STATION NUMBER Station ID

TYPE SCDHEC station type code

- P = Primary station, sampled monthly all year round
- S = Secondary station, sampled monthly May - October
- P* = Secondary station upgraded to primary station parameter coverage and sampling frequency for basin study
- W = Special watershed station added for the Savannah River Basin study
- BIO = Indicates macroinvertebrate community data assessed

WATERBODY NAME Stream or Lake Name

CLASS Stream classification at the point where monitoring station is located

Parameter Abbreviations and Parameter Measurement Units:

DO	Dissolved Oxygen (mg/l)	NH3	Ammonia (mg/l)
BOD	Five-Day Biochemical Oxygen Demand (mg/l)	CD	Cadmium (ug/l)
pH	pH (SU)	CR	Chromium (ug/l)
TP	Total Phosphorus (mg/l)	CU	Copper (ug/l)
TN	Total Nitrogen (mg/l)	PB	Lead (ug/l)
TURB	Turbidity (NTU)	HG	Mercury (ug/l)
TSS	Total Suspended Solids (mg/l)	NI	Nickel (ug/l)
BACT	Fecal Coliform Bacteria (#/100 ml)	ZN	Zinc (ug/l)

Statistical Abbreviations:

N For standards compliance, number of surface samples collected between January 1996 and December 2000.
For trends, number of surface samples collected between January 1984 and December 2000.
For total phosphorus, an additional trend period of January 1992 to December 2000 is also reported.

EXC. Number of samples contravening the appropriate standard

% Percentage of samples contravening the appropriate standard

MEAN EXC. Mean of samples that contravened the applied standard

MED For heavy metals with a human health criterion, this is the median of all surface samples between January 1996 and December 2000. DL indicates that the median was the detection limit.

MAG Magnitude of any statistically significant trend, average change per year, expressed in parameter measurement units

GEO MEAN Geometric mean of fecal coliform bacteria samples collected between January 1996 and December 2000

Key to Trends:

D Statistically significant decreasing trend in parameter concentration
I Statistically significant increasing trend in parameter concentration
* No statistically significant trend
Blank Insufficient data to test for long term trends

LOWER SAVANNAH RIVER BASIN WATER QUALITY SUMMARY

STATION				DO	DO	DO	MEAN	TRENDS (86 -2000)					
NUMBER	TYPE	WATERBODY NAME	CLASS	N	EXC.	%	EXC.	DO	N	MAG	BOD	N	MAG
03060107010													
SV-151	P/BIO	HARD LABOR CK	FW	57	4	7	4.625	*	136	0.000	D	135	-0.133
SV-731	BIO	HARD LABOR CK	FW										
SV-351	SS/BIO	CUFFYTOWN CK	FW	24	4	17	3.925						
SV-730	BIO	ROCKY CK	FW										
SV-330	P	STEVENS CK	FW	60	0	0		D	151	-0.067	D	147	-0.051
03060107020													
SV-729	BIO	TURKEY CK	FW										
SV-728	BIO	LOG CK	FW										
SV-727	BIO	ROCKY CK	FW										
SV-352	SS	TURKEY CK	FW	24	0	0							
03060107030													
SV-068	S	BEAVERDAM CK	FW	29	2	7	4.650	*	80	0.025	D	79	-0.130
SV-353	SS/BIO	BEAVERDAM CK	FW	24	0	0							
03060107040													
SV-063	BIO	STEVENS CK	FW										
SV-354	SS	STEVENS CK	FW	24	0	0							
SV-726	BIO	HORN CK	FW										
SV-725	BIO	CHEVES CK	FW										
03060106030													
SV-294	P	LAKE, STEVENS CK RESERVOIR	FW	60	7	12	4.029	*	180	0.000	D	176	-0.048
03060106060													
CL-067	SS*	LAKE, VAUCLUSE POND	FW	10	0	0							
SV-686	SS*	LAKE, FLAT ROCK POND	FW	9	0	0							
SV-722	SS*	LAKE, GRANITEVILLE POND #2	FW	8	0	0							
SV-329	P	HORSE CK	FW	57	0	0		*	145	0.025	D	143	-0.040
SV-071	P	HORSE CK	FW	58	0	0		*	179	0.002	D	177	-0.035
SV-069	P/BIO	SAND RVR	FW	56	0	0		*	176	0.017	*	176	0.000
CL-069	SS*	LAKE, LANGLEY POND	FW	7	0	0							
SV-096	P	HORSE CK	FW	57	0	0		*	156	0.018	D	157	-0.059
SV-724	BIO	LITTLE HORSE CK	FW										
SV-073	S	LITTLE HORSE CK	FW	30	0	0		I	84	0.033	D	84	-0.067
SV-072	S/BIO	HORSE CK	FW	29	0	0		*	83	0.000	D	83	-0.087
SV-250	P	HORSE CK	FW	59	0	0		*	181	0.015	*	178	0.000
03060106050													
SV-251	P	SAVANNAH RVR	FW	59	0	0		*	182	0.008	D	178	-0.039
SV-252	P	SAVANNAH RVR	FW	59	3	5	4.333	*	180	0.018	D	176	-0.034
SV-323	P	SAVANNAH RVR	FW	59	0	0		*	180	0.000	D	175	-0.034

LOWER SAVANNAH RIVER BASIN WATER QUALITY SUMMARY

STATION				pH	pH	pH	MEAN	TRENDS (86-2000)			TURB	TURB	TURB	MEAN	TRENDS (86-2000)		
NUMBER	TYPE	WATERBODY NAME	CLASS	N	EXC.	%	EXC.	PH	N	MAG	N	EXC.	%	EXC.	TURB	N	MAG
03060107010																	
SV-151	P/BIO	HARD LABOR CK	FW	57	0	0		D	137	-0.015	56	4	7	155.0	D	135	-0.827
SV-731	BIO	HARD LABOR CK	FW														
SV-351	SS/BIO	CUFFYTOWN CK	FW	24	1	4	5.95				24	2	8	67.5			
SV-730	BIO	ROCKY CK	FW														
SV-330	P	STEVENS CK	FW	60	2	3	9.000	*	151	-0.020	60	5	8	88.0	*	149	-0.140
03060107020																	
SV-729	BIO	TURKEY CK	FW														
SV-728	BIO	LOG CK	FW														
SV-727	BIO	ROCKY CK	FW														
SV-352	SS	TURKEY CK	FW	24	0	0					24	0	0				
03060107030																	
SV-068	S	BEAVERDAM CK	FW	29	1	3	5.94	D	80	-0.025	28	2	7	87.5	*	79	-0.075
SV-353	SS/BIO	BEAVERDAM CK	FW	24	0	0					24	0	0				
03060107040																	
SV-063	BIO	STEVENS CK	FW														
SV-354	SS	STEVENS CK	FW	24	0	0					24	3	13	78.3			
SV-726	BIO	HORN CK	FW														
SV-725	BIO	CHEVES CK	FW														
03060106030																	
SV-294	P	LAKE, STEVENS CK RESERVOIR	FW	60	7	12	5.850	D	179	-0.042	59	0	0		D	177	-0.113
03060106060																	
CL-067	SS*	LAKE, VAUCLUSE POND	FW	10	5	50	5.874				7	0	0				
SV-686	SS*	LAKE, FLAT ROCK POND	FW	8	6	75	5.677				6	0	0				
SV-722	SS*	LAKE, GRANITEVILLE POND #2	FW	8	8	100	5.593				6	0	0				
SV-329	P	HORSE CK	FW	55	22	40	5.779	D	143	-0.036	59	0	0		*	146	0.066
SV-071	P	HORSE CK	FW	56	20	36	5.742	D	177	-0.013	59	1	2	85	*	179	0.009
SV-069	P/BIO	SAND RVR	FW	55	36	65	5.617	*	175	-0.011	59	5	8	274.0	D	178	-0.135
CL-069	SS*	LAKE, LANGLEY POND	FW	6	2	33	5.475				5	0	0				
SV-096	P	HORSE CK	FW	56	13	23	5.789	D	155	-0.038	59	1	2	115	*	158	-0.029
SV-724	BIO	LITTLE HORSE CK	FW														
SV-073	S	LITTLE HORSE CK	FW	30	7	23	5.871	D	84	-0.025	30	1	3	210	*	84	0.133
SV-072	S/BIO	HORSE CK	FW	29	11	38	5.868	D	83	-0.023	29	0	0		*	83	0.000
SV-250	P	HORSE CK	FW	59	26	44	5.869	D	181	-0.010	60	0	0		*	176	0.044
03060106050																	
SV-251	P	SAVANNAH RVR	FW	59	3	5	5.850	D	182	-0.025	60	0	0		*	178	-0.028
SV-252	P	SAVANNAH RVR	FW	59	2	3	5.770	D	180	-0.022	59	0	0		D	176	-0.113
SV-323	P	SAVANNAH RVR	FW	59	1	2	5.98	D	180	-0.023	59	0	0		*	174	-0.068

LOWER SAVANNAH RIVER BASIN WATER QUALITY SUMMARY

STATION				TP	TP	TP	MEAN	TRENDS (92-2000)			TRENDS (86-2000)		
NUMBER	TYPE	WATERBODY NAME	CLASS	N	EXC.	%	EXC.	TP	N	MAG	TP	N	MAG
03060107010													
SV-151	P/BIO	HARD LABOR CK	FW					D	65	-0.030	D	99	-0.069
SV-731	BIO	HARD LABOR CK	FW										
SV-351	SS/BIO	CUFFYTOWN CK	FW										
SV-730	BIO	ROCKY CK	FW										
SV-330	P	STEVENS CK	FW					D	75	-0.007	D	116	-0.002
03060107020													
SV-729	BIO	TURKEY CK	FW										
SV-728	BIO	LOG CK	FW										
SV-727	BIO	ROCKY CK	FW										
SV-352	SS	TURKEY CK	FW										
03060107030													
SV-068	S	BEAVERDAM CK	FW					*	30	-0.015	D	62	-0.033
SV-353	SS/BIO	BEAVERDAM CK	FW										
03060107040													
SV-063	BIO	STEVENS CK	FW										
SV-354	SS	STEVENS CK	FW										
SV-726	BIO	HORN CK	FW										
SV-725	BIO	CHEVES CK	FW										
03060106030													
SV-294	P	LAKE, STEVENS CK RESERVOIR	FW	29	1	3	0.09	*	74	0.000	*	142	0.000
03060106060													
CL-067	SS*	LAKE, VAUCLUSE POND	FW										
SV-686	SS*	LAKE, FLAT ROCK POND	FW										
SV-722	SS*	LAKE, GRANITEVILLE POND #2	FW										
SV-329	P	HORSE CK	FW					I	74	0.000	I	109	0.000
SV-071	P	HORSE CK	FW					*	76	0.000	D	144	0.000
SV-069	P/BIO	SAND RVR	FW					*	75	0.000	D	142	0.000
CL-069	SS*	LAKE, LANGLEY POND	FW										
SV-096	P	HORSE CK	FW					*	72	0.000	D	121	0.000
SV-724	BIO	LITTLE HORSE CK	FW										
SV-073	S	LITTLE HORSE CK	FW								D	65	-0.001
SV-072	S/BIO	HORSE CK	FW								D	63	0.000
SV-250	P	HORSE CK	FW					*	77	0.000	D	145	-0.001
03060106050													
SV-251	P	SAVANNAH RVR	FW					I	76	0.000	D	141	0.000
SV-252	P	SAVANNAH RVR	FW					*	77	0.000	D	145	0.000
SV-323	P	SAVANNAH RVR	FW					*	76	0.000	D	143	0.000

LOWER SAVANNAH RIVER BASIN WATER QUALITY SUMMARY

STATION				TN	TN	TN	MEAN	TRENDS (86-2000)			CHL	CHL	CHL	MEAN	TRENDS (86-2000)		
NUMBER	TYPE	WATERBODY NAME	CLASS	N	EXC.	%	EXC.	TN	N	MAG	N	EXC.	%	EXC.	TSS	N	MAG
03060107010																	
SV-151	P/BIO	HARD LABOR CK	FW					*	96	-0.015							
SV-731	BIO	HARD LABOR CK	FW														
SV-351	SS/BIO	CUFFYTOWN CK	FW														
SV-730	BIO	ROCKY CK	FW														
SV-330	P	STEVENS CK	FW					*	143	-0.005							
03060107020																	
SV-729	BIO	TURKEY CK	FW														
SV-728	BIO	LOG CK	FW														
SV-727	BIO	ROCKY CK	FW														
SV-352	SS	TURKEY CK	FW														
03060107030																	
SV-068	S	BEAVERDAM CK	FW														
SV-353	SS/BIO	BEAVERDAM CK	FW														
03060107040																	
SV-063	BIO	STEVENS CK	FW														
SV-354	SS	STEVENS CK	FW														
SV-726	BIO	HORN CK	FW														
SV-725	BIO	CHEVES CK	FW														
03060106030																	
SV-294	P	LAKE, STEVENS CK RESERVOIR	FW	58	0	0		D	169	-0.008							
03060106060																	
CL-067	SS*	LAKE, VAUCLUSE POND	FW	6	0	0					9	0	0				
SV-686	SS*	LAKE, FLAT ROCK POND	FW	6	0	0					9	0	0				
SV-722	SS*	LAKE, GRANITEVILLE POND #2	FW	6	0	0					8	0	0				
SV-329	P	HORSE CK	FW					D	138	-0.008							
SV-071	P	HORSE CK	FW					D	172	-0.008							
SV-069	P/BIO	SAND RVR	FW					D	170	-0.008							
CL-069	SS*	LAKE, LANGLEY POND	FW	6	0	0					8	0	0				
SV-096	P	HORSE CK	FW					*	124	-0.007							
SV-724	BIO	LITTLE HORSE CK	FW														
SV-073	S	LITTLE HORSE CK	FW														
SV-072	S/BIO	HORSE CK	FW														
SV-250	P	HORSE CK	FW					*	175	-0.003							
03060106050																	
SV-251	P	SAVANNAH RVR	FW					D	172	-0.010							
SV-252	P	SAVANNAH RVR	FW					D	174	-0.011							
SV-323	P	SAVANNAH RVR	FW					D	171	-0.010					*	156	0.000

LOWER SAVANNAH RIVER BASIN WATER QUALITY SUMMARY

STATION				GEO	BACT	BACT	BACT	MEAN	TRENDS (86-2000)			NH3	NH3	NH3	CD	CD	CD	MEAN
NUMBER	TYPE	WATERBODY NAME	CLASS	MEAN	N	EXC.	%	EXC.	BACT	N	MAG	N	EXC.	%	N	EXC.	%	EXC.
03060107010																		
SV-151	P/BIO	HARD LABOR CK	FW	178	57	20	35	981	D	137	-28.541	54	0	0	18	1	6	20
SV-731	BIO	HARD LABOR CK	FW															
SV-351	SS/BIO	CUFFYTOWN CK	FW	111	24	3	13	720				22	0	0	8	0	0	
SV-730	BIO	ROCKY CK	FW															
SV-330	P	STEVENS CK	FW	56	60	2	3	600	*	151	1.001	58	0	0	19	0	0	
03060107020																		
SV-729	BIO	TURKEY CK	FW															
SV-728	BIO	LOG CK	FW															
SV-727	BIO	ROCKY CK	FW															
SV-352	SS	TURKEY CK	FW	90	24	0	0					23	0	0	8	0	0	
03060107030																		
SV-068	S	BEAVERDAM CK	FW	85	29	1	3	600	*	79	-5.946							
SV-353	SS/BIO	BEAVERDAM CK	FW	91	24	2	8	1615				23	0	0	8	0	0	
03060107040																		
SV-063	BIO	STEVENS CK	FW															
SV-354	SS	STEVENS CK	FW	58	24	1	4	510				20	0	0	6	0	0	
SV-726	BIO	HORN CK	FW															
SV-725	BIO	CHEVES CK	FW															
03060106030																		
SV-294	P	LAKE, STEVENS CK RESERVOIR	FW	7	61	0	0		I	178	0.100	58	0	0	20	0	0	
03060106060																		
CL-067	SS*	LAKE, VAUCLUSE POND	FW	5	7	0	0					6	0	0				
SV-686	SS*	LAKE, FLAT ROCK POND	FW	63	6	0	0					6	0	0				
SV-722	SS*	LAKE, GRANITEVILLE POND #2	FW	15	6	0	0					6	0	0				
SV-329	P	HORSE CK	FW	63	59	1	2	600	I	145	1.792	55	0	0	19	1	5	20
SV-071	P	HORSE CK	FW	63	59	2	3	450	D	176	-2.998	54	0	0	19	0	0	
SV-069	P/BIO	SAND RVR	FW	82	59	2	3	600	*	174	-1.255	51	0	0	19	0	0	
CL-069	SS*	LAKE, LANGLEY POND	FW	11	5	0	0					6	0	0				
SV-096	P	HORSE CK	FW	53	59	2	3	570	*	154	2.225	53	0	0	18	0	0	
SV-724	BIO	LITTLE HORSE CK	FW															
SV-073	S	LITTLE HORSE CK	FW	70	30	3	10	520	*	84	2.351	3	0	0				
SV-072	S/BIO	HORSE CK	FW	73	29	6	21	947	*	82	2.465	3	0	0				
SV-250	P	HORSE CK	FW	86	60	8	13	759	I	177	3.507	58	0	0	20	0	0	
03060106050																		
SV-251	P	SAVANNAH RVR	FW	59	60	5	8	738	D	177	-8.837	56	0	0	20	0	0	
SV-252	P	SAVANNAH RVR	FW	60	60	5	8	528	D	176	-4.227	56	0	0	20	0	0	
SV-323	P	SAVANNAH RVR	FW	30	60	1	2	430	D	176	-1.235	56	0	0	20	0	0	

LOWER SAVANNAH RIVER BASIN WATER QUALITY SUMMARY

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	CR N	CR EXC.	CR %	MEAN EXC.	CU N	CU EXC.	CU %	MEAN EXC.	PB N	PB EXC.	PB %	MEAN EXC.	HG N	HG EXC.	HG %
03060107010																		
SV-151	P/BIO	HARD LABOR CK	FW	18	0	0		18	0	0		18	0	0		18	0	0
SV-731	BIO	HARD LABOR CK	FW															
SV-351	SS/BIO	CUFFYTOWN CK	FW	8	0	0		8	0	0		8	0	0		8	0	0
SV-730	BIO	ROCKY CK	FW															
SV-330	P	STEVENS CK	FW	19	0	0		19	0	0		19	0	0		19	0	0
03060107020																		
SV-729	BIO	TURKEY CK	FW															
SV-728	BIO	LOG CK	FW															
SV-727	BIO	ROCKY CK	FW															
SV-352	SS	TURKEY CK	FW	8	0	0		8	0	0		8	0	0		8	0	0
03060107030																		
SV-068	S	BEAVERDAM CK	FW															
SV-353	SS/BIO	BEAVERDAM CK	FW	8	0	0		8	0	0		8	0	0		8	0	0
03060107040																		
SV-063	BIO	STEVENS CK	FW															
SV-354	SS	STEVENS CK	FW	6	0	0		6	0	0		6	0	0		6	0	0
SV-726	BIO	HORN CK	FW															
SV-725	BIO	CHEVES CK	FW															
03060106030																		
SV-294	P	LAKE, STEVENS CK RESERVOIR	FW	20	0	0		20	0	0		20	0	0		20	0	0
03060106060																		
CL-067	SS*	LAKE, VAUCLUSE POND	FW															
SV-686	SS*	LAKE, FLAT ROCK POND	FW															
SV-722	SS*	LAKE, GRANITEVILLE POND #2	FW															
SV-329	P	HORSE CK	FW	19	0	0		19	0	0		19	0	0		19	0	0
SV-071	P	HORSE CK	FW	19	0	0		19	1	5	20	19	0	0		19	0	0
SV-069	P/BIO	SAND RVR	FW	19	0	0		19	1	5	20	19	1	5	70	19	0	0
CL-069	SS*	LAKE, LANGLEY POND	FW															
SV-096	P	HORSE CK	FW	18	0	0		18	0	0		18	0	0		18	0	0
SV-724	BIO	LITTLE HORSE CK	FW															
SV-073	S	LITTLE HORSE CK	FW															
SV-072	S/BIO	HORSE CK	FW															
SV-250	P	HORSE CK	FW	20	0	0		20	0	0		20	0	0		20	0	0
03060106050																		
SV-251	P	SAVANNAH RVR	FW	20	0	0		20	0	0		20	0	0		20	0	0
SV-252	P	SAVANNAH RVR	FW	20	0	0		20	0	0		20	0	0		20	0	0
SV-323	P	SAVANNAH RVR	FW	20	0	0		20	0	0		20	0	0		20	0	0

LOWER SAVANNAH RIVER BASIN WATER QUALITY SUMMARY

STATION NUMBER	TYPE	WATERBODY NAME	CLASS		NI N	NI EXC.	NI %	MEAN EXC.		ZN N	ZN EXC.	ZN %	MEAN EXC.
03060107010													
SV-151	P/BIO	HARD LABOR CK	FW		18	0	0			18	0	0	
SV-731	BIO	HARD LABOR CK	FW										
SV-351	SS/BIO	CUFFYTOWN CK	FW		8	0	0			8	0	0	
SV-730	BIO	ROCKY CK	FW										
SV-330	P	STEVENS CK	FW		19	0	0			19	0	0	
03060107020													
SV-729	BIO	TURKEY CK	FW										
SV-728	BIO	LOG CK	FW										
SV-727	BIO	ROCKY CK	FW										
SV-352	SS	TURKEY CK	FW		8	0	0			8	1	13	90
03060107030													
SV-068	S	BEAVERDAM CK	FW										
SV-353	SS/BIO	BEAVERDAM CK	FW		8	0	0			8	0	0	
03060107040													
SV-063	BIO	STEVENS CK	FW										
SV-354	SS	STEVENS CK	FW		6	0	0			6	0	0	
SV-726	BIO	HORN CK	FW										
SV-725	BIO	CHEVES CK	FW										
03060106030													
SV-294	P	LAKE, STEVENS CK RESERVOIR	FW		20	0	0			20	0	0	
03060106060													
CL-067	SS*	LAKE, VAUCLUSE POND	FW										
SV-686	SS*	LAKE, FLAT ROCK POND	FW										
SV-722	SS*	LAKE, GRANITEVILLE POND #2	FW										
SV-329	P	HORSE CK	FW		19	0	0			19	0	0	
SV-071	P	HORSE CK	FW		19	0	0			19	1	5	110
SV-069	P/BIO	SAND RVR	FW		19	0	0			19	0	0	
CL-069	SS*	LAKE, LANGLEY POND	FW										
SV-096	P	HORSE CK	FW		18	0	0			18	0	0	
SV-724	BIO	LITTLE HORSE CK	FW										
SV-073	S	LITTLE HORSE CK	FW										
SV-072	S/BIO	HORSE CK	FW										
SV-250	P	HORSE CK	FW		20	0	0			20	0	0	
03060106050													
SV-251	P	SAVANNAH RVR	FW		20	0	0			20	0	0	
SV-252	P	SAVANNAH RVR	FW		20	0	0			20	0	0	
SV-323	P	SAVANNAH RVR	FW		20	0	0			20	0	0	

LOWER SAVANNAH RIVER BASIN WATER QUALITY SUMMARY

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	DO N	DO EXC.	DO %	MEAN EXC.	TRENDS (86 -2000) DO	N	MAG	BOD	N	MAG
03060106070													
SV-350	SS/BIO	HOLLOW CK	FW	23	0	0							
03060106100													
SV-680	BIO	UPPER THREE RUNS	FW										
SV-723	BIO	CEDAR CK	FW										
SV-324	P	TIMS BRANCH	FW	36	0	0		*	156	0.014	*	152	0.000
SV-325	P	UPPER THREE RUNS	FW	36	0	0		*	157	0.033	D	153	-0.020
03060106110													
SV-326	P	FOURMILE CK	FW	36	1	3	4.40	*	156	0.018	D	150	-0.017
SV-327	P	STEEL CK	FW	36	0	0		I	155	0.042	D	151	-0.067
03060106130													
SV-328	P/BIO	LOWER THREE RUNS CK	FW	59	0	0		I	177	0.043	D	174	-0.042
SV-175	P*	LOWER THREE RUNS CK	FW	40	0	0		I	95	0.045	D	95	-0.083
03060106140													
SV-118	P	SAVANNAH RVR	FW	59	0	0		*	179	0.008	*	176	-0.013
SV-745	BIO	BRIER CK	FW										
03060109050													
SV-355	SS	SAVANNAH RVR	FW	23	0	0							
03060109060													
SV-744	BIO	CYPRESS BRANCH	FW										
SV-356	SS	CYPRESS CK	FW	22	13	59	1.699						
SV-191	P	SAVANNAH RVR	SB*	58	8	14	4.481	*	172	-0.011	D	167	-0.100

LOWER SAVANNAH RIVER BASIN WATER QUALITY SUMMARY

STATION				pH	pH	pH	MEAN	TRENDS (86-2000)			TURB	TURB	TURB	MEAN	TRENDS (86-2000)		
NUMBER	TYPE	WATERBODY NAME	CLASS	N	EXC.	%	EXC.	PH	N	MAG	N	EXC.	%	EXC.	TURB	N	MAG
03060106070																	
SV-350	SS/BIO	HOLLOW CK	FW	23	16	70	5.529				24	0	0				
03060106100																	
SV-680	BIO	UPPER THREE RUNS	FW														
SV-723	BIO	CEDAR CK	FW														
SV-324	P	TIMS BRANCH	FW	36	8	22	5.491	D	156	-0.033	35	0	0		*	149	-0.045
SV-325	P	UPPER THREE RUNS	FW	36	9	25	5.576	*	157	-0.014	36	0	0		*	151	-0.029
03060106110																	
SV-326	P	FOURMILE CK	FW	36	2	6	5.780	D	156	-0.017	36	1	3	65	*	150	0.040
SV-327	P	STEEL CK	FW	36	0	0		D	155	-0.028	36	0	0		D	150	-0.187
03060106130																	
SV-328	P/BIO	LOWER THREE RUNS CK	FW	58	2	3	8.075	D	177	-0.025	59	0	0		I	175	0.033
SV-175	P*	LOWER THREE RUNS CK	FW	40	0	0		D	96	-0.026	40	0	0		*	95	0.063
03060106140																	
SV-118	P	SAVANNAH RVR	FW	58	1	2	10.60	D	179	-0.025	58	3	5	66.7	*	175	-0.049
SV-745	BIO	BRIER CK	FW														
03060109050																	
SV-355	SS	SAVANNAH RVR	FW	21	0	0					23	0	0				
03060109060																	
SV-744	BIO	CYPRESS BRANCH	FW														
SV-356	SS	CYPRESS CK	FW	20	9	45	6.157				18	0	0				
SV-191	P	SAVANNAH RVR	SB*	56	9	16	6.333	I	170	0.025	55	11	20	36.5	*	166	-0.142

LOWER SAVANNAH RIVER BASIN WATER QUALITY SUMMARY

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	TP N	TP EXC.	TP %	MEAN EXC.	TRENDS (92-2000) TP	N	MAG	TRENDS (86-2000) TP	N	MAG
03060106070													
SV-350	SS/BIO	HOLLOW CK	FW										
03060106100													
SV-680	BIO	UPPER THREE RUNS	FW										
SV-723	BIO	CEDAR CK	FW										
SV-324	P	TIMS BRANCH	FW					D	74	-0.005	*	141	0.000
SV-325	P	UPPER THREE RUNS	FW					*	72	0.000	*	137	0.000
03060106110													
SV-326	P	FOURMILE CK	FW					I	72	0.020	I	137	0.002
SV-327	P	STEEL CK	FW					I	72	0.001	D	140	-0.001
03060106130													
SV-328	P/BIO	LOWER THREE RUNS CK	FW					*	74	0.000	D	144	0.000
SV-175	P*	LOWER THREE RUNS CK	FW					*	43	0.000	*	79	0.000
03060106140													
SV-118	P	SAVANNAH RVR	FW					I	76	0.005	*	143	-0.001
SV-745	BIO	BRIER CK	FW										
03060109050													
SV-355	SS	SAVANNAH RVR	FW										
03060109060													
SV-744	BIO	CYPRESS BRANCH	FW										
SV-356	SS	CYPRESS CK	FW										
SV-191	P	SAVANNAH RVR	SB*					*	74	0.004	*	137	0.002

LOWER SAVANNAH RIVER BASIN WATER QUALITY SUMMARY

STATION				TN	TN	TN	MEAN	TRENDS (86-2000)			CHL	CHL	CHL	MEAN	TRENDS (86-2000)		
NUMBER	TYPE	WATERBODY NAME	CLASS	N	EXC.	%	EXC.	TN	N	MAG	N	EXC.	%	EXC.	TSS	N	MAG
03060106070																	
SV-350	SS/BIO	HOLLOW CK	FW														
03060106100																	
SV-680	BIO	UPPER THREE RUNS	FW														
SV-723	BIO	CEDAR CK	FW														
SV-324	P	TIMS BRANCH	FW					D	147	-0.030							
SV-325	P	UPPER THREE RUNS	FW					D	143	-0.016							
03060106110																	
SV-326	P	FOURMILE CK	FW					*	144	-0.027							
SV-327	P	STEEL CK	FW					D	146	-0.025							
03060106130																	
SV-328	P/BIO	LOWER THREE RUNS CK	FW					D	170	-0.010							
SV-175	P*	LOWER THREE RUNS CK	FW														
03060106140																	
SV-118	P	SAVANNAH RVR	FW					D	168	-0.011					*	153	0.000
SV-745	BIO	BRIER CK	FW														
03060109050																	
SV-355	SS	SAVANNAH RVR	FW														
03060109060																	
SV-744	BIO	CYPRESS BRANCH	FW														
SV-356	SS	CYPRESS CK	FW														
SV-191	P	SAVANNAH RVR	SB*					D	164	-0.023							

LOWER SAVANNAH RIVER BASIN WATER QUALITY SUMMARY

STATION				GEO	BACT	BACT	BACT	MEAN	TRENDS (86-2000)			NH3	NH3	NH3	CD	CD	CD	MEAN
NUMBER	TYPE	WATERBODY NAME	CLASS	MEAN	N	EXC.	%	EXC.	BACT	N	MAG	N	EXC.	%	N	EXC.	%	EXC.
03060106070																		
SV-350	SS/BIO	HOLLOW CK	FW	215	24	3	13	850				20	0	0	8	0	0	
03060106100																		
SV-680	BIO	UPPER THREE RUNS	FW															
SV-723	BIO	CEDAR CK	FW															
SV-324	P	TIMS BRANCH	FW	173	36	4	11	550	*	152	-2.497	32	0	0	10	0	0	
SV-325	P	UPPER THREE RUNS	FW	150	36	3	8	933	*	153	1.709	33	0	0	9	0	0	
03060106110																		
SV-326	P	FOURMILE CK	FW	95	36	4	11	598	*	152	0.901	34	0	0	10	0	0	
SV-327	P	STEEL CK	FW	53	36	1	3	430	I	151	1.170	34	0	0	9	0	0	
03060106130																		
SV-328	P/BIO	LOWER THREE RUNS CK	FW	142	59	6	10	770	I	177	3.338	53	0	0	19	0	0	
SV-175	P*	LOWER THREE RUNS CK	FW	124	40	2	5	535	I	96	4.966	23	0	0	7	0	0	
03060106140																		
SV-118	P	SAVANNAH RVR	FW	32	59	0	0		D	177	-1.864	54	0	0	18	0	0	
SV-745	BIO	BRIER CK	FW															
03060109050																		
SV-355	SS	SAVANNAH RVR	FW	24	22	1	5	620				20	0	0	7	0	0	
03060109060																		
SV-744	BIO	CYPRESS BRANCH	FW															
SV-356	SS	CYPRESS CK	FW	64	17	1	6	1730				15	0	0	4	0	0	
SV-191	P	SAVANNAH RVR	SB*	121	56	8	14	799	*	164	0.000	55	0	0	19	0	0	

LOWER SAVANNAH RIVER BASIN WATER QUALITY SUMMARY

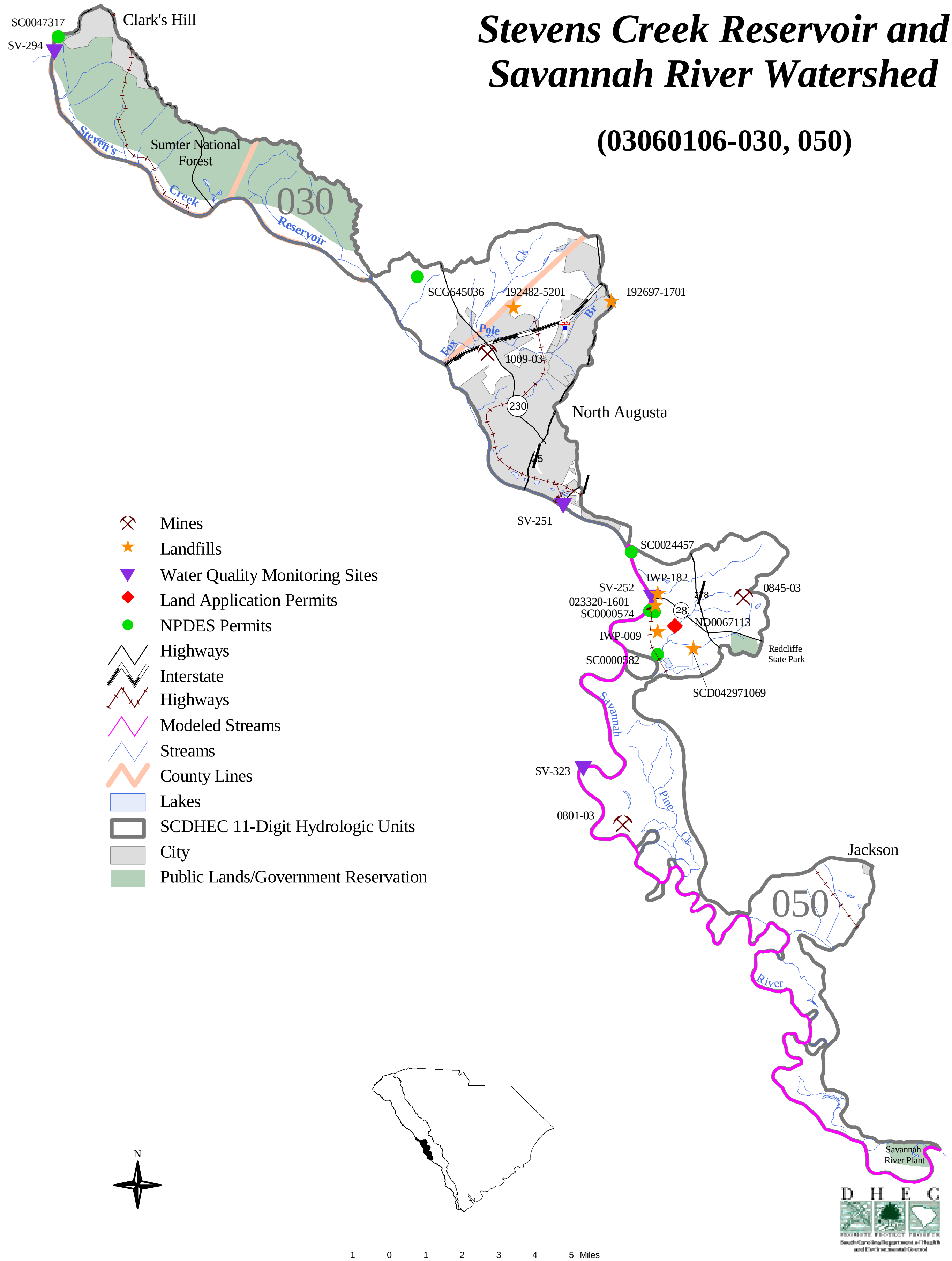
STATION NUMBER	TYPE	WATERBODY NAME	CLASS	CR N	CR EXC.	CR %	MEAN EXC.	CU N	CU EXC.	CU %	MEAN EXC.	PB N	PB EXC.	PB %	MEAN EXC.	HG N	HG EXC.	HG %
03060106070																		
SV-350	SS/BIO	HOLLOW CK	FW	8	0	0		8	0	0		8	0	0		8	0	0
03060106100																		
SV-680	BIO	UPPER THREE RUNS	FW															
SV-723	BIO	CEDAR CK	FW															
SV-324	P	TIMS BRANCH	FW	10	0	0		10	0	0		10	0	0		10	0	0
SV-325	P	UPPER THREE RUNS	FW	9	0	0		9	0	0		9	0	0		9	0	0
03060106110																		
SV-326	P	FOURMILE CK	FW	10	0	0		10	0	0		10	0	0		10	0	0
SV-327	P	STEEL CK	FW	9	0	0		9	0	0		9	0	0		9	0	0
03060106130																		
SV-328	P/BIO	LOWER THREE RUNS CK	FW	19	0	0		19	0	0		19	1	5	100	19	0	0
SV-175	P*	LOWER THREE RUNS CK	FW	7	0	0		7	0	0		7	0	0		7	0	0
03060106140																		
SV-118	P	SAVANNAH RVR	FW	18	0	0		18	0	0		18	0	0		18	0	0
SV-745	BIO	BRIER CK	FW															
03060109050																		
SV-355	SS	SAVANNAH RVR	FW	7	0	0		7	0	0		7	0	0		7	0	0
03060109060																		
SV-744	BIO	CYPRESS BRANCH	FW															
SV-356	SS	CYPRESS CK	FW	4	0	0		4	0	0		4	0	0		4	0	0
SV-191	P	SAVANNAH RVR	SB*	19	0	0		19	1	5	20	19	0	0		19	0	0

LOWER SAVANNAH RIVER BASIN WATER QUALITY SUMMARY

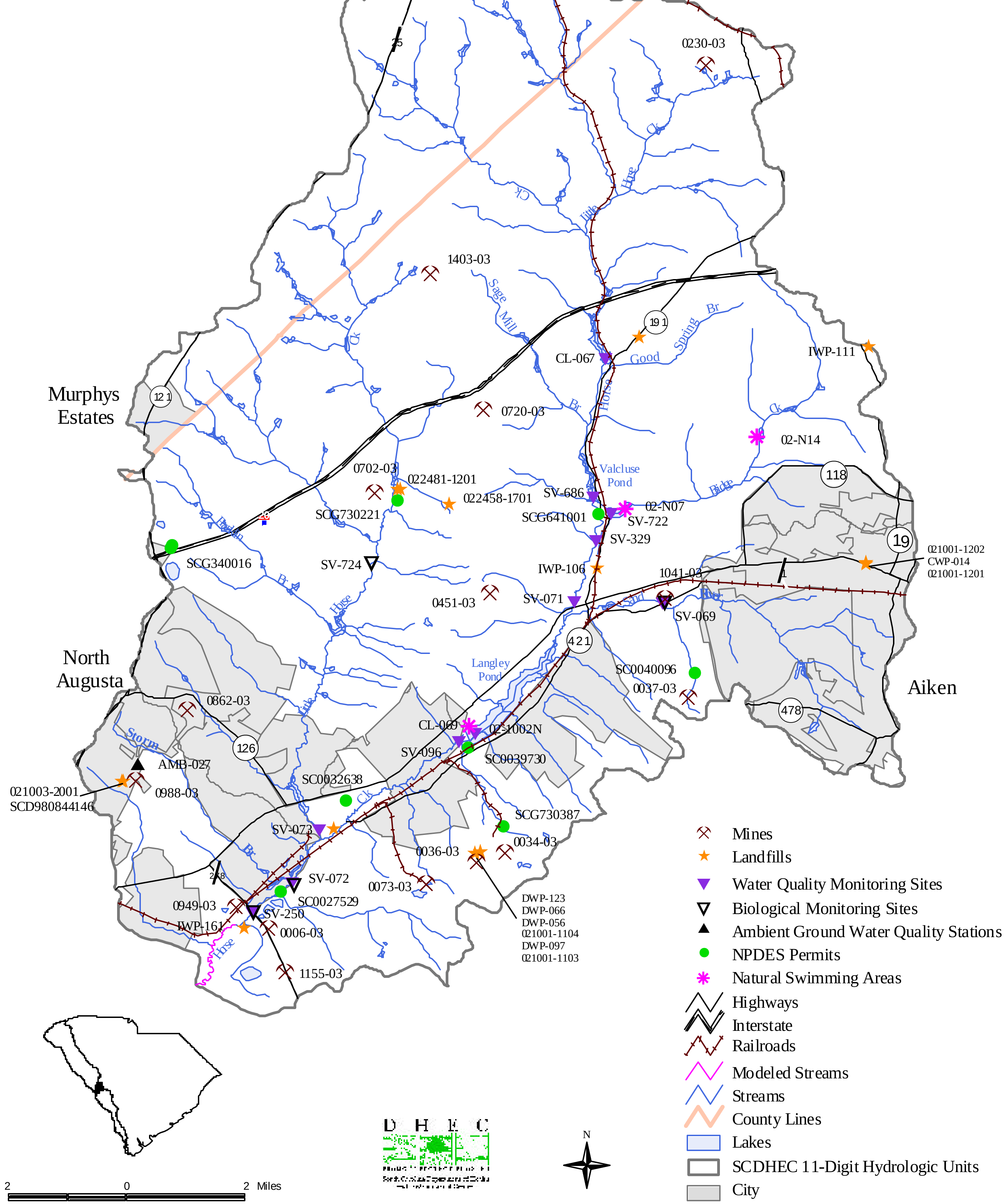
STATION NUMBER	TYPE	WATERBODY NAME	CLASS		NI N	NI EXC.	NI %	MEAN EXC.		ZN N	ZN EXC.	ZN %	MEAN EXC.
03060106070													
SV-350	SS/BIO	HOLLOW CK	FW		8	0	0			8	0	0	
03060106100													
SV-680	BIO	UPPER THREE RUNS	FW										
SV-723	BIO	CEDAR CK	FW										
SV-324	P	TIMS BRANCH	FW		10	0	0			10	0	0	
SV-325	P	UPPER THREE RUNS	FW		9	0	0			9	1	11	110
03060106110													
SV-326	P	FOURMILE CK	FW		10	0	0			10	0	0	
SV-327	P	STEEL CK	FW		9	0	0			9	0	0	
03060106130													
SV-328	P/BIO	LOWER THREE RUNS CK	FW		19	0	0			19	0	0	
SV-175	P*	LOWER THREE RUNS CK	FW		7	0	0			7	0	0	
03060106140													
SV-118	P	SAVANNAH RVR	FW		18	0	0			18	0	0	
SV-745	BIO	BRIER CK	FW										
03060109050													
SV-355	SS	SAVANNAH RVR	FW		7	0	0			7	0	0	
03060109060													
SV-744	BIO	CYPRESS BRANCH	FW										
SV-356	SS	CYPRESS CK	FW		4	0	0			4	0	0	
SV-191	P	SAVANNAH RVR	SB*		19	0	0			19	0	0	

Stevens Creek Reservoir and Savannah River Watershed

(03060106-030, 050)

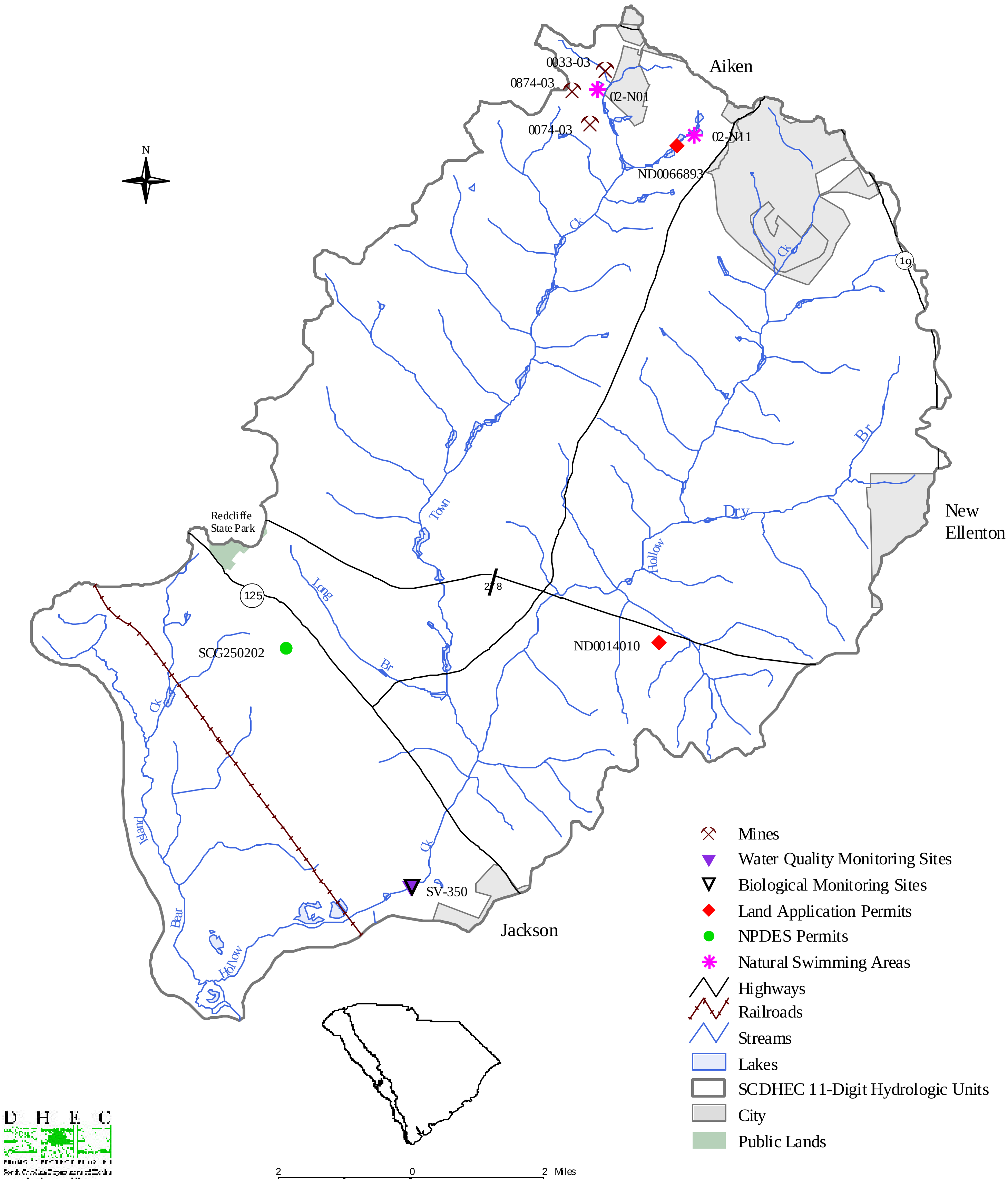


Horse Creek Watershed
(03060106-060)



Hollow Creek Watershed

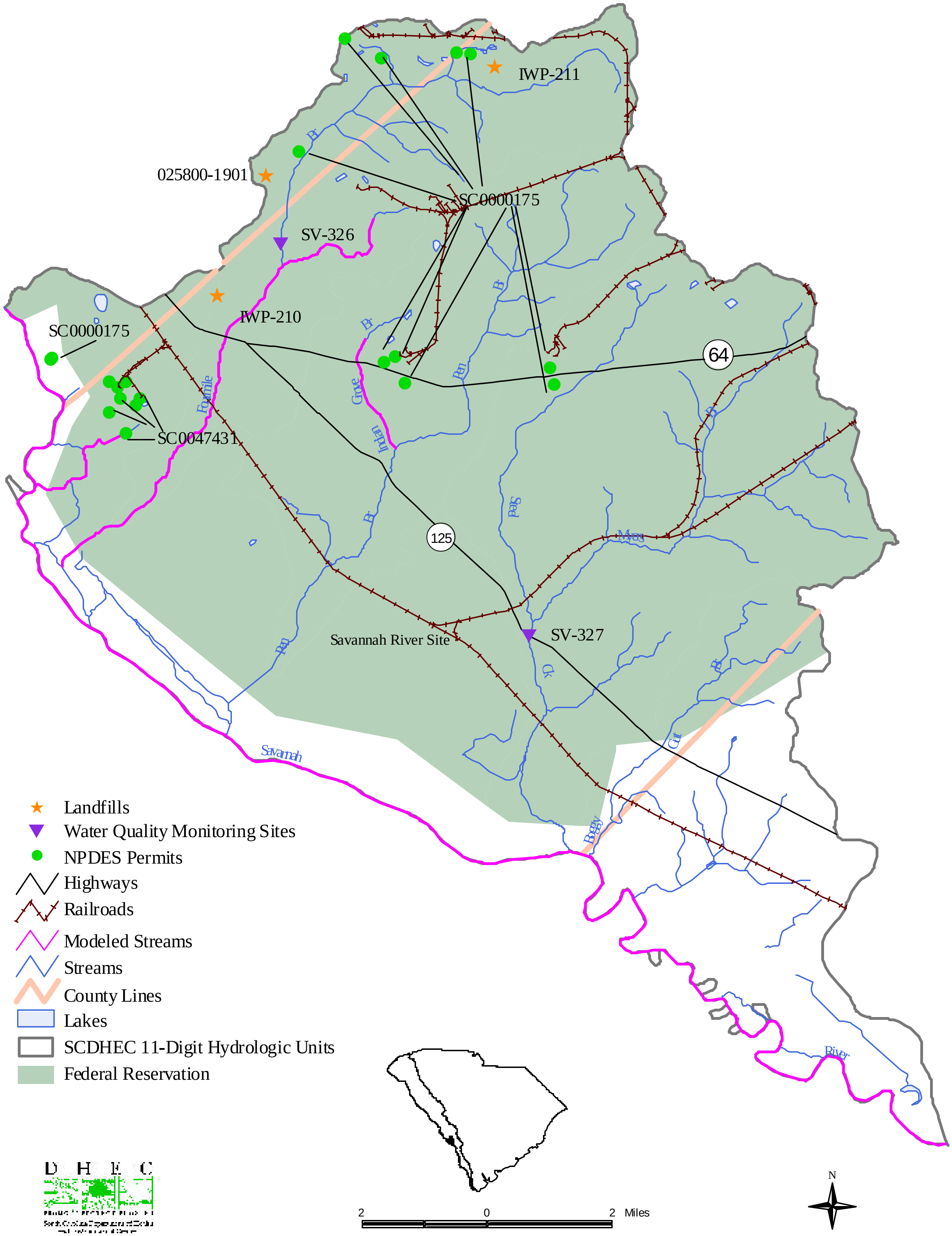
(03060106-070)



Upper Three Runs Watershed

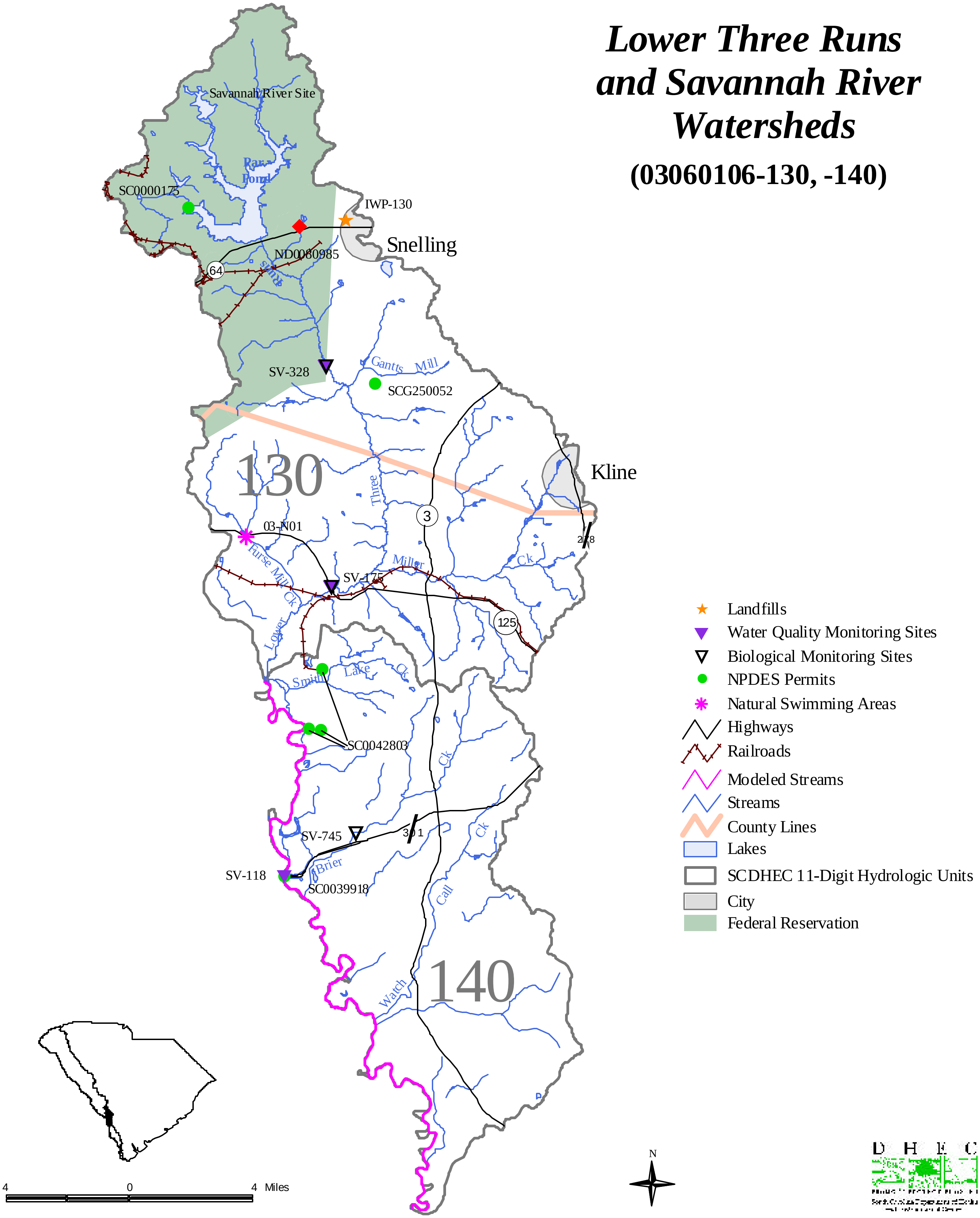
(03060106-100)

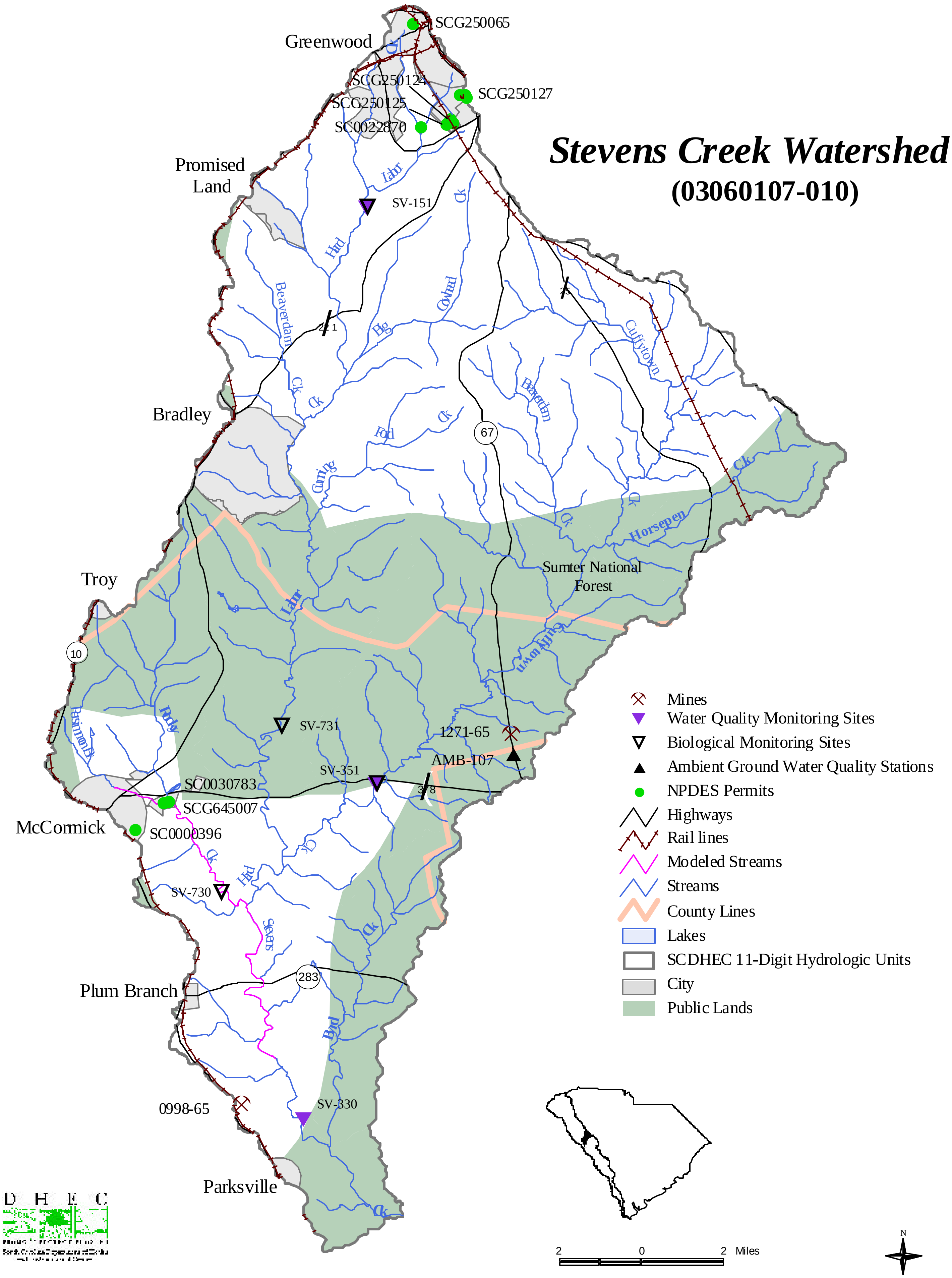
Savannah River Watershed
(03060106-110)



Lower Three Runs and Savannah River Watersheds

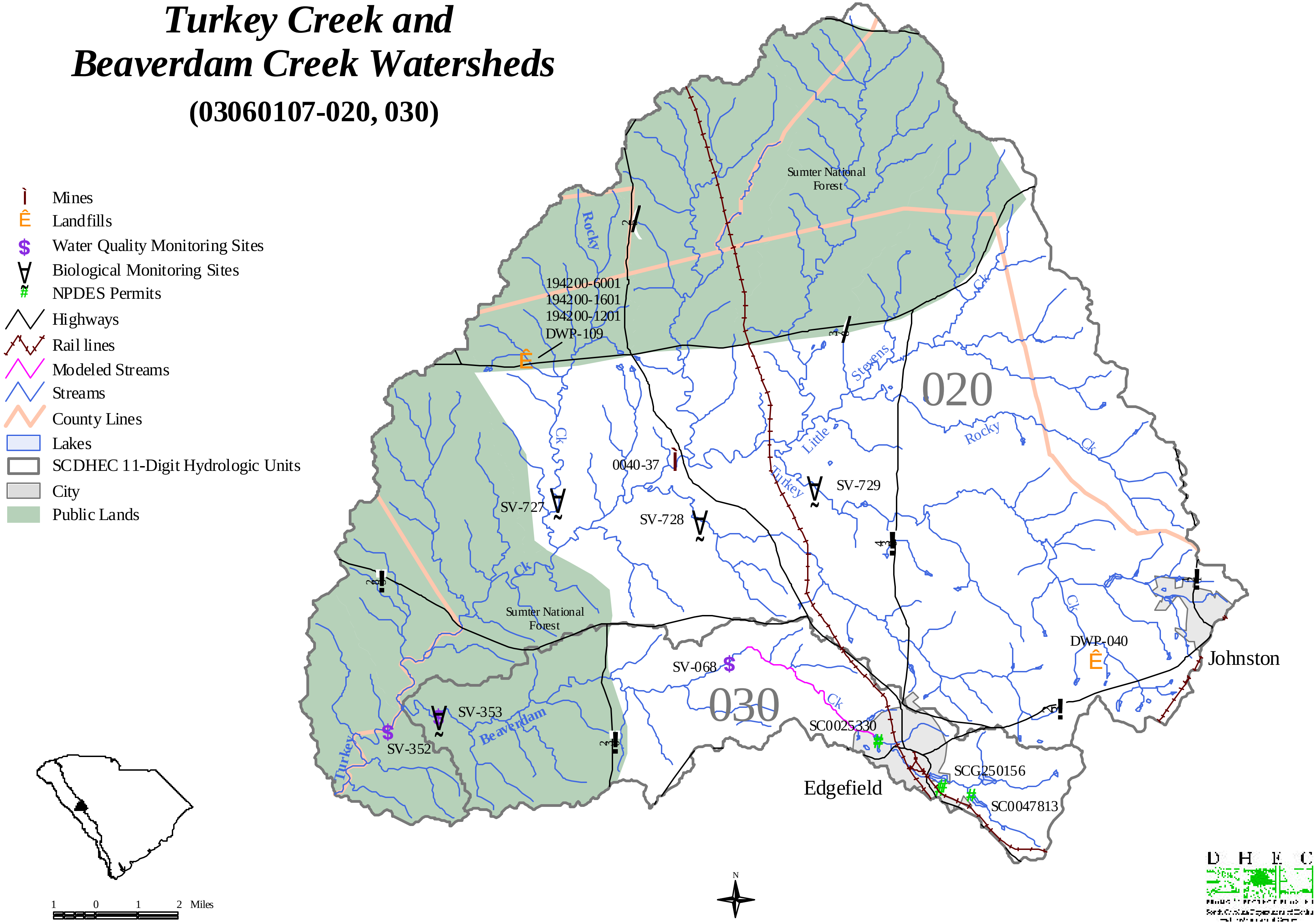
(03060106-130, -140)




Stevens Creek Watershed
(03060107-010)
Greenwood
SCG250065
SCG250124
SCG250125
SCG250127
SC0022870
Promised Land
SV-151
Bradley
Troy
McCormick
SC0030783
SCG645007
SC0000396
SV-731
SV-351
SV-730
1271-65
AMB-107
Sumter National Forest
Plum Branch
0998-65
SV-330
Parksville
Horsepen
Cuffytown
Beaverdam
Stevens
67
10
283
378
Mines
Water Quality Monitoring Sites
Biological Monitoring Sites
Ambient Ground Water Quality Stations
NPDES Permits
Highways
Rail lines
Modeled Streams
Streams
County Lines
Lakes
SCDHEC 11-Digit Hydrologic Units
City
Public Lands
2
0
2
Miles
N

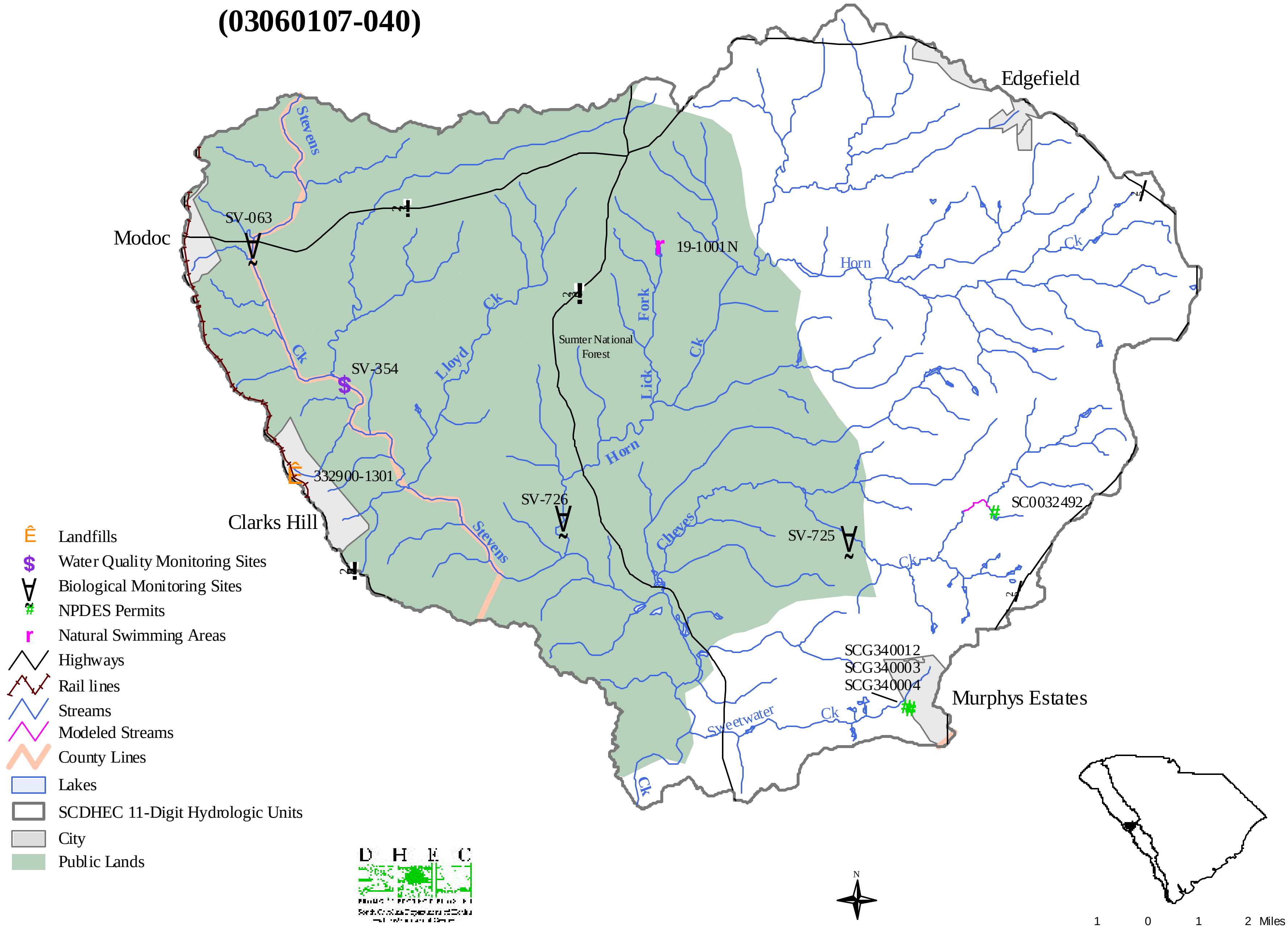
Turkey Creek and Beaverdam Creek Watersheds

(03060107-020, 030)



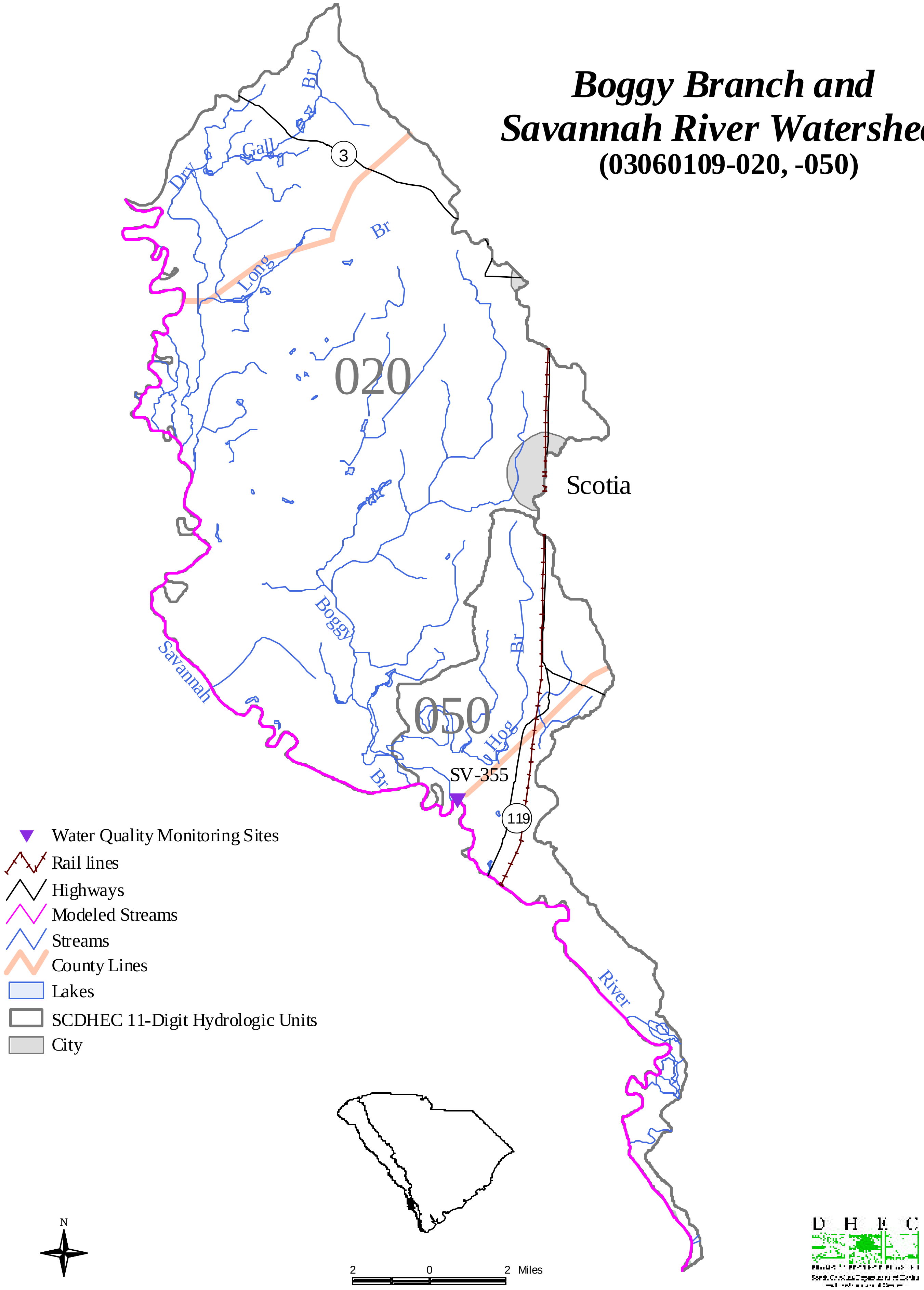
Stevens Creek Watershed

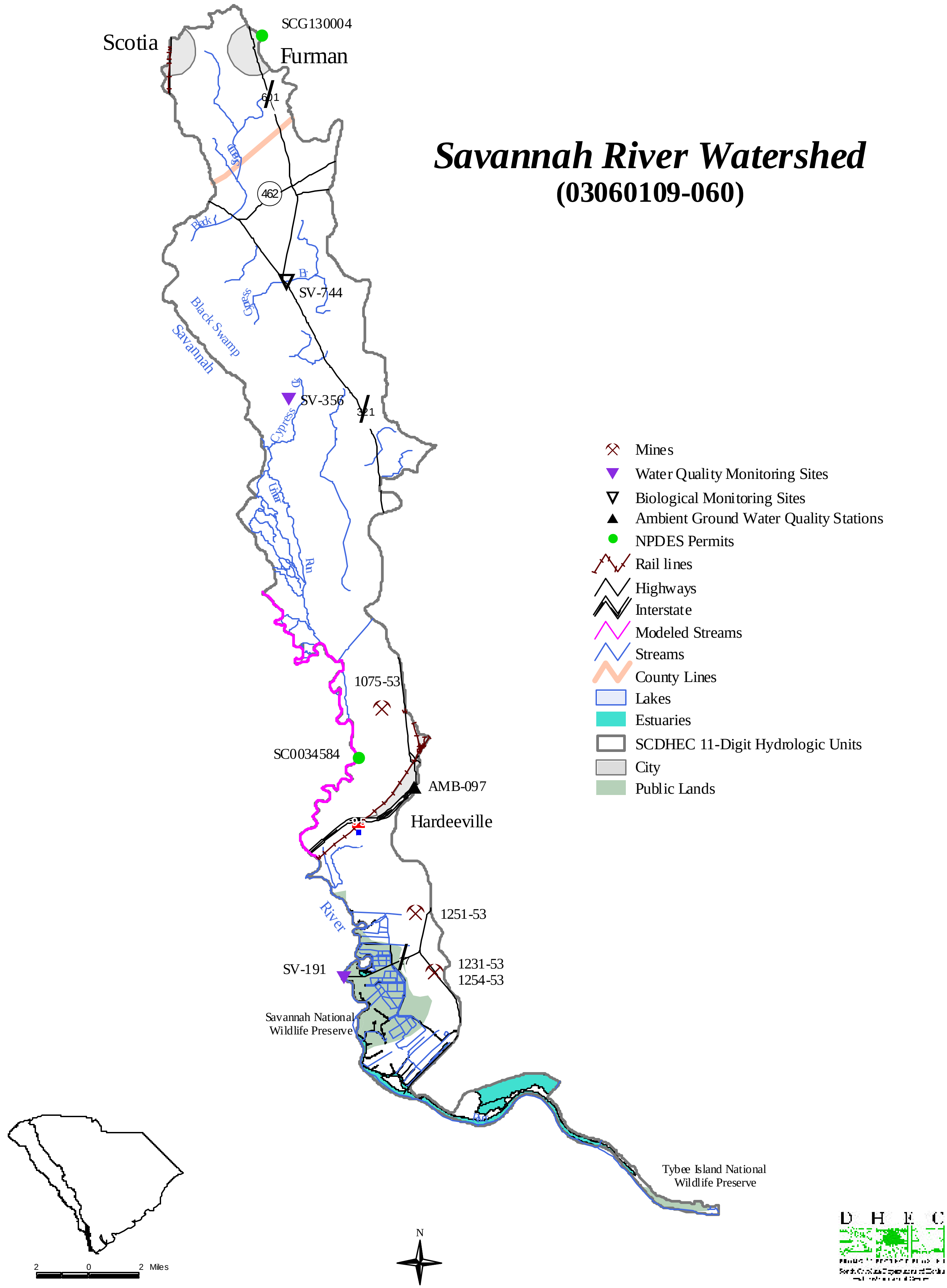
(03060107-040)



Boggy Branch and Savannah River Watersheds

(03060109-020, -050)





Savannah River Watershed
(03060109-060)
Scotia
Furman
SCG130004
601
462
Black
SV-744
Black Swamp
Savannah
SV-356
Cypress
321
Rn
1075-53
SC0034584
AMB-097
Hardeeville
River
1251-53
SV-191
1231-53
1254-53
Savannah National Wildlife Preserve
Tybee Island National Wildlife Preserve
Mines
Water Quality Monitoring Sites
Biological Monitoring Sites
Ambient Ground Water Quality Stations
NPDES Permits
Rail lines
Highways
Interstate
Modeled Streams
Streams
County Lines
Lakes
Estuaries
SCDHEC 11-Digit Hydrologic Units
City
Public Lands
N
2 0 2 Miles
D H E C

Waterbody Index

Facility Index

Facility Permit Number Index

NPDES

General Permits

General Permits Continued

Land Application

Mining

Natural SwimmingAreas

Landfills

Landfills Continued

Landfills Continued

D H E C

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